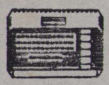
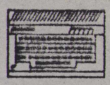
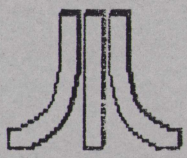
T—Y—N—E—&—W—E—A—R





TYNE & WEAR



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ISSUE #11

September/October 1994

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EDITORIAL

Who to blame!!!

John Matthewson
David Ewens
Max Gerum

We have had a request to use a countdown number system, similar to Page 6, to remind readers when to renew their subscription. David informed me that the database he is using gives him the renewel dates for each subscriber.

When a subscription is due he always encloses a new Order Form in the final issue, or a new form follows seperately shortly afterwards. David believes this is a better method to remind our readers than just a number on the mailing label.

The contribution fees for home and abroad:

HOME	1 COPY	£2.00
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What a lovely responce for PD software from our subscribers. We thank you very much indeed for your support and we hope to get some new software for your enjoyment in the near future.

REMINDER:

The book--The Complete and Essential Map--anyone unable to pay the full amount of the cash price can, if he or she so wish, pay in instalments, whenever and whatever they can and at the same as the cash price. At the final payment you will receive the book.

The next issue will be ready by mid-November.

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XL TWO

XL2 (with SpartaDOS/MYDOS/DOSXL)

I am sorry to say, XL2 only works with an upgraded XL or standard 130XE.

This program turns a 130XE into two XL's. With XL2 installed you have two computers in memory and can switch between them at will. XL2 is designed for use with a limited number of disk-based FMS's, it is not designed for use with boot disks. This version may work with SpartaDOS X but will not support SDX on in only one system. It may also work with the R Time-8 but it will not use the R18 clock.

TWO COMPUTERS?--Yes you have two independant computer systems which can be swapped and in each a different program can be run.

-- You also get additional keyboard editing functions,

-- A calendar/clock with a display line which works with all three supported FMS,

-- Display of disk drive information or alternatively programming information.

-- SpartaDOS users will be saying, I've got a TDLINE, according to the information in the instructions, using XL2 in place of TDLINE, can save you 586 bytes at low memory.

INSTALLING XL2:

Firstly boot your disk with your favourite DOS, I use MYDOS, when loaded either with BASIC or without, use the 'L' option to load "XL2.COM". The author does not recommend its use as an autorun or in a startup batch.

Once XL2 is installed you can switch systems by pressing Control-Help. XL2 is compatible with Turbo BASIC, BASIC XE, MAC/65, Action! and TextPro+. One system can be operated with the cartridge enabled and disabled in the other.

KEYBOARD FUNCTIONS:

XL2 provides additional screen editing functions, the key function guide is included in the instructions.

TIME/DATE SUPPORT:

XL2 maintains a fairly accurate sofware clock which works independant of the currently selected system. You can switch from a Sparta to a MYDOS system, work there for as long as you like and return to Sparta without having to reset the time.

To improve accuracy, the clock corrects itself at the end of every hour when you will notice a jump of four or five seconds.

Setting the time is easy, with Sparta use the TIME and DATE commands. With other FMS it's a little more complex.
You must go into BASIC and POKE the time and date directly into the XL2 handler.

As I said in the above paragraph, go into BASIC, now type the following POKE's without a break, only press Return at the end. Here are the POKE's you type:

```
POKE 960,DAY     (1 to 31):
POKE 961,MONTH   (1 to 12):
POKE 962,YEAR    (0 to 99):
POKE 963,HOUR    (0 to 23):
POKE 964,MINUTE (0 to 59):
POKE 965,SECOND (0 to 59):
```

You do not type the POKE's as shown above, type the POKE's as one continuous line. Following is an example for the inexperienced readers.

```
POKE 960,15:POKE 961,9:POKE
962,94:POKE 963,9:POKE
964,45:POKE 965,5
```

After you have typed in all six values press and hold SELECT then press SHIFT-CONTROL-U to start the clock. Here is what the Time/Date line will display from the values typed in above: 9:45:05 15 Sep 94.

Besides the time/date it also monitors the disk read/write for any drive from 1 to 9, tells you what system you're in and displays any errors that occur. For more information on the other displays consult the instructions. I haven't had the opportunity yet to get acquainted with the program.

XL2 is available from our PD library as a two disk set, it also contains the source code of MYDOS version 4.51. Both disk must be un-ARCed before use, after unarcing you will also need to un-DISCOM the three MYDOS's. All documentations are included on the disks.

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PD REVIEW

By David Davies

PUNGO

When David asked me if I wanted to do the occasional independent (please note!) PD Review for TWAUG, I jumped at the chance. This was despite the fact that I am dubious about the quality of a lot of software available in the Public Domain.

PD Games are especially bad in my opinion with poor gameplay coupled with blocky, amateurish graphics, so it was with a little apprehension that I received one of the latest pieces of software to be included in the TWAUG PD library.

Pungo is a game written by Kemal Ezcan of Ke-Soft in Germany. When I first heard David mention the title, my first thoughts were of an old arcade game that many of you may remember called Pengo! Reading the English instructions supplied on side 2 of the disk (the original German instructions are also included) also made me think of Pengo.

Anyway, after loading the disk without BASIC (i.e. pressing OPTION on boot-up) I was greeted with a nice mode 15 title screen showing a cute little penguin. Actually, now I come to think of it, the screen looks remarkably similar to the title screen of an old MSX game I read about in C+VG a few years ago! Surely Kemal didn't dredge through a friend's MSX collection to come up with a suitable title screen?

After pressing START, I was thrust into the game selection screen. This is a fairly simple text-only affair with which you can select one of three starting points. Game A starts you off at the start of the game, choose Game B and you're in level 6, choose Game C and you're in level 12. The heading to this screen says 'Arcade Classics #1'. Of course, now I was certain that I was indeed dealing with a Pengo rip-off.

One thing I did find a bit odd about this screen is that, although the game itself is joystick controlled, you can't use the joystick to move the selection pointer and must use the SELECT key. This leads on to another point ... you can ONLY use the SELECT key to move the pointer down. I would have expected to be able to move the pointer up as well by use of the OPTION key. A little thing, perhaps, considering that the pointer returns to the topmost option when you reach the end of the game list, but it would not have been difficult for something like this to be implemented - and it would help the overall feel of the game.

Anyway, after you've moved the pointer, all that needs to be done is press START to enter the game.

For those of you who don't recall the original Pengo, the game was fairly simple. You are a penguin stuck in a labyrinth made of two types of block. The normal type can be destroyed if it's joined to another. Alternatively, if it has space to move, then it can be pushed with a fair amount of force across or up/down the screen. The other type of block is a diamond.

These are indestructible but can be pushed in the same way that the others can. A special bonus can be obtained by lining up the three diamond blocks that appear on each screen. You can line up the diamonds vertically or horizontally to claim your bonus.

Of course, if it was as easy as that, then it'd be very boring. And, of course, there's more. You are constantly being harassed by snow bees. These are mindless creatures that wander about aimlessly (they're even denser than the ghosts in Pac-Man). Your aim is to squash them by pushing a block against them. This does at times require precision timing due to the speed of the bees.

You have to be careful since the snowbees destroy any blocks that are in their way. Also, only three snowbees are active at once. However, there are others hiding inside blocks and these are activated when you destroy a snowbee. So when you destroy a snowbee, you have to be very careful that you're not standing by a block containing the next snowbee to be activated.

One more advantage that you have is the fact that if you push against one of the borders at the same time as a snowbee, then that bee will become momentarily stunned and give you enough time to launch a block at it.

Movement of your penguin and the snowbees are good and the reaction to the joystick movements are swift. The graphics are fairly basic, but then again the original graphics in Pengo weren't exactly state of the art.

Overall, Pungo is an enjoyable game, and may be especially so if you haven't played the original Pengo before. For my money, though, Microdeal's version (Pengon) of ten years ago is better but then that's now very difficult to get hold of.

NEW ATARI USER PAGE 6

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PAGE 6
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BASIC TUTORIAL-ANIMATION 1

Altough I had a break in the articles, I'm back with a series of articles about animation. My main task is to teach you BASIC, but when concerned with animation I have to take the time and teach you something about the inner works of the Atari computer.

We will be discussing all types of animation possible on the Atari, from the basic to the inner works of the Atari computer.

We will be discussing all types of animation possible on the Atari, from the basic page flipping to other known principles. But first, we have to acquire some preliminary knowledge to animate, and we will start with the DISPLAY LIST (DL for short, from now on). A final remark (true for all the articles on this subject) before we get to business: Altough I was in the habit of mentioning Turbo-Basic programing only at the end, I will include it in the following articles alongside the standard Atari Basic.

THE ATARI DISPLAY LIST (DL)

The picture we see on our Atari screen is built by the ANTIC video processor using a Display List. This list is automatically built by the computer when, for example we do a graphics call, but if we understand this list and learn some special commands associated with it, we can edit it ourselves and create beautiful effects. Lets use the Graphics 2 display list as an example to show how it works (I chose this example because it's the shortest display list and easy to work with).

Graphics 2 DL:

```
112
112
112
71 (64+7)
112
158
7
7
7
7
7
7
7
7
7
66 (64+2)
96
159
2
2
2
65
88
158
```

Lets try to translate this collection of numbers to english using a Basic program format.

```
100 Draw 8 blank scan lines
110 Draw 8 blank scan lines
120 Draw 8 blank scan lines
130 Mode 2 line - with screen memory starting at:
140 High byte of screen memory
150 Low byte of screen memory
160 Mode 2 line
170 Mode 2 line
180 Mode 2 line
190 Mode 2 line
200 Mode 2 line
210 Mode 2 line
220 Mode 2 line
230 Mode 2 line
240 Mode 2 line
250 Mode 0 line - with screen memory starting at:
260 High byte of screen memory
270 Low byte of screen memory
280 Mode 0 line
290 Mode 0 line
300 Mode 0 line
310 Goto 100 (Adress specified in next 2 bytes)
320 (High byte of 'goto' address)
330 (Low byte of 'goto' address)
```

These lines are the translated version of the numbers. Now lets try to understand them.

Each screen starts with 24 scan blank lines (3 Mode 0 lines). This is true for every screen, and not only Graphics 2. Following these blank lines we have a Load Memory Scan (LMS) instruction, together with the chosen mode. The LMS tells the computer to use the next two bytes as the address for the screen memory. The screen memory is the area of memory in which the computer stores all the actions concerning the specific mode. In plain English, if you draw something on the screen it will be stored in that memory area. If you want to see the screen, the area of memory accessed is that area. After the LMS we have a repetition of the code for the required mode, according to the number of lines we need. For example, in mode 2, we have 9 times 7, which is the code for mode 2 (There are actually 10 lines in a mode 2 screen but if you remember one of them is included in the LMS),

At the end of our example we see another LMS for the mode 0 window at the bottom of the screen. At the end of the display list there is a jump instruction to the begining of the DL so it could be redrawn (the instruction is actualy: Jump and wait for Vertical Blank), because the computer redraws the picture a lot of times per second. That's the whole story. If you study it closely you will see that it's not that complicated and we will learn to change the DL to accommodate our needs.

Lets discuss some addresses. First the locations 560,561 point to the beginning of the DL: DL=PEEK(560)+256*PEEK(561). This way we can find it, edit it or even rebuild it and the computer would'nt care as long as it has an address to use. The address of the screen memory seen at DL+4, DL+5 is also stored at 88,89 in the same way: SCRMEM = PEEK(88) + 256*PEEK(89). This is useful and we will see why later.

ANIMATION continued

From all we have seen so far it is obvious that the DL could be changed to create mixed modes and other nice things, but we will not discuss mixed modes, because we are trying to learn about animation so we will discuss another concept called page flipping. As a general remark, for everybody who wants to know more about the DL, write to me with questions, all letters will be answered. Also, at the end of the article there will be a table of all DL special commands, so play with it.

PAGE FLIPPING

When we hear the word 'animation' we immediately picture a Walt Disney movie, but in general the term is used for all kinds of moving pictures which simulate live events. Lets look at television. Television shows us a constantly changing environment but actually it is a set of still pictures which are flipped one after another very fast so we cannot distinguish it, like a super fast slide show. Television shows us 24 pictures per second and thus we see it constantly moving. The page flipping principle works the same way, by changing a set of pictures very fast on the screen we create a live moving environment. This is why we needed to know and understand the DL. The graphics mode accesses its memory through the DL screen memory address at location DL+4, DL+5. Now imagine that we load some pictures from disk into reserved memory space and then we write a program to change locations DL+4, DL+5 to point each time to a different picture, and if we do it fast enough and the pictures are suitable we have created a movie or a moving action.

In theory all this seems very fascinating and true, but now lets discuss some technical difficulties. First our Atari is relatively slow so we cannot flip a lot of pictures if we want a reliable animation, second we must remember that we still work in basic so basic also has his speed limitations. Last problem is memory. On uncompressed picture (Micro Painter format) takes 62 sectors on disk which are 7.6K of memory. So there is a limit to the number of pictures we can load into memory. The reading speed is not fast enough to load the picture at the required time. There are ways around the problems if we really want high quality results (Like using a fast decompression routine in memory and loading compressed pictures, etc.), but really good results can be achieved without hardship as the demo program - 'Max Headroom' will show. (Maybe you have encountered it before, since I didn't write it, but you should still take a look at the program since I added helpful comments.)

Page flipping can be used, not only for animation, for example if you are running a game and want to show an intro text screen and at the same time to load a picture, you will setup the graphics screen first change MEMTOP (Which points to the end of memory) to point to the DL of the graphics screen and then setup a text screen (thus allocating memory for the graphics screen), then you will write on the text screen, flip the memory at 88,89 and load the picture. Thus on the screen you will see text while the computer loads a picture to the allocated memory.

After loading the picture you can flip screens and show the picture. The same principle can be applied for a mathematical program that draws graphs, one screen is used for the graphs and a text screen is used for input. The graphic screen can then be saved, graphs can be drawn on the other, and the graph could be saved while you are prompted for it at the text screen. The implementations are infinite. In addition to the demo program I will also add a general program to setup two screens and a small demo to flip between them. If you want to flip more than two screens the principles are the same, but watch out for memory space.

This will conclude the first in a series of articles about animation. The programs will be supplied in two versions: Atari Basic version and Turbo Basic version for comparison. I know this may seem a little vague because I really tried to minimize the technical information supplied, as this is a Basic tutorial, but for any questions, comments, remarks, critics, etc. Just write to me and I promise to answer all letters.

The next article in the series will discuss character sets and their use for animation.

My Address:

OFER SAFERMAN
21 BRANDE ST.
PETAH-TIQVA, 49600
ISRAEL

DL INSTRUCTIONS

Blank lines

0 - 1 Blank scan line.
16 - 2 Blank scan lines.
32 - 3 Blank scan lines.
48 - 4 Blank scan lines.
64 - 5 Blank scan lines.
80 - 6 Blank scan lines.
96 - 7 Blank scan lines.
112 - 8 Blank scan lines.

Mode lines

2 - mode 2 line.
a Basic graphics mode (text mode - 10 scan lines per line).
4 - mode 12 line.
5 - mode 13 line.
6 - mode 1 line.
7 - mode 2 line.
8 - mode 3 line.
9 - mode 4 line.
10 - mode 5 line.
11 - mode 6 line.
12 - mode 14 line.
13 - mode 7 line.
14 - mode 15 line.
15 - mode 8,9,10,11 line (The access to modes 9-11 is via the GTIA chip)

ANIMATION continued

Special instructions

The folowing codes are added to the mode code numbers or the LMS. Some of them will be discussed in the third article.

128 - Display List Interrupt.
16 - Horizontal scroll.
32 - Vertical scroll.
64 - Load Memory Scan (LMS). (Must be followed by address)

Jump instructions

There are only two jump instructions, they must be followed by the jump address. The first which usually is the only one used, must appear at the end of the DL.

65 - Jump and wait for Vertical Blank.
1 - Jump.

Mode lines

2 - mode 2 line.
3 - not a Basic graphics mode (text mode - 10 scan lines per line).
4 - mode 12 line.
5 - mode 13 line.
6 - mode 1 line.
7 - mode 2 line.
8 - mode 3 line.
9 - mode 4 line.
10 - mode 5 line.
11 - mode 6 line.
12 - mode 14 line.
13 - mode 7 line.
14 - mode 15 line.
15 - mode 8,9,10,11 line (The access to modes 9-11 is via the GTIA chip)

FILING BY LINE NUMBERS

By Allan Doyley.

As a writer of inelegant programs, I hesitate to print this method, Which I use an a extension of my home accounts program, to list notable expenditures, using Basic line numbers as pigeon-holes.

Let's say that in week ending 5th of April our car was repaired for £60. As the 5th of April is the last day of the tax year it is in tax week 52. Car repairs are in account no.3 and, as it is in the first year, that year's prefix "0". So we have made up a line 00352 (352) REM followed by brief details of the repair/cost.

As the week number is the last two digits of the line number, and the account number immediately precedes it, the entries in each year will, of course, sort themselves into account order, and weekly order within each account when listed.

FILING continued

Another example would be: in the second year, late July (week 16), a window pane was replaced. So: 1 (second year) ,17 (Property repairs) ,16 (week) = "11716 REM NEW PANE FRONT WINDOW £80".

As the highest Basic line number is 21656, 4 years are available (3 if more than 27 accounts are used) before going back to the the "0" prefix. Each year is headed (in inverse video) with the dates covered, and the following auto-list scans the past 4 or 5 week details which I have put in (in one go) as a check:

```
30000 X=10108: Y=10112:LIST X,Y:REM THIS FIELD COVERS
WEEKS 8 TO F12
30005 FOR Q=1 TO 200:NEXT Q:REM SCAN SPEED
30010 X=X+100:Y=Y+100:LIST X,Y:GOTO 30005
```

The BREAK key is used to stop the loop when editing, for direct access to the program (as opposed to CONTROL+1).

Finally, because of the extra day in each year (52 weeks * 7 = 364), two in leap years, about every fifth year has 53 weeks in it..... To those who are still reading this, may I thank you for persevering and hope that you will find this method useful, as it might also have applications in other areas of computing.

PASCAL-1

By Ralph Bradley.

HEX1.PAS

HEX1.PAS is written in DRAPER-PASCAL and converts DECIMAL Numbers into HEXADECIMAL Numbers. HEX1.PCD is the compiled version of the programme for immediate Running.

HEX1.PAS Converts Decimal to Hex. (Enter 0 - 32767).

PASCAL/DRAPER-PASCAL

PASCAL is a Modern, High Level, Structured, Compiled Language. The Programme presented here is written in DRAPER PASCAL on the ATARI 8-BIT Machine.

I will give a brief explanation of PASCAL commands, the rest of the commands are similar to ATARI or other BASICs.

The VAR command is used for defining VARiables. In PASCAL any variables used must first be defined. You must also tell the programme what the variable type is.

VARiable TYPE

CONST is a number that remains CONSTant throughout the programme. Once defined it can-not be changed.

INTEGER VAR is for INTEGER numbers (without decimal points) ex. C=1 A=5

REAL VAR is for numbers that use decimal points ex. A=1.2

PASCAL continued

STRING VAR is for STRINGS, like ATARI BASIC (A$="123", B$="ABC").

CHAR VAR is for a STRING of length ONE CHARACTER (A$="Y", B$="1").

Examples

CONST CLEAR=125; same as CLEAR=125 except Can-Not be changed

VAR A,B:INTEGER; use VARiables A & B in INTEGER FORMAT
VAR A,W:REAL; use VARiables A & W in REAL FORMAT

VAR H:STRING[16]; same as DIM H$(16) in ATARI-BASIC
VAR REPLY:CHAR; same as DIM REPLY$(1) in ATARI-BASIC

Extensions

VAR Z:ARRAY[3] OF REAL;

This is the same as DIM Z(3) in ATARI BASIC. The numbers are stored in DECIMAL POINT (REAL) Format (1.2, 8.7).

VAR Z:ARRAY[15] OF INTEGER;

This is almost the same as DIM Z(15) in ATARI BASIC except that numbers are stored in INTEGER (no decimal points) Format (1,2).

PASCAL-2

Commands

In PASCAL 'WRITE' means 'PRINT' and 'READ' means 'INPUT'.

```
  WRITE = PRINT " ";
WRITELN = PRINT " "  (Note NO-COLON)

CHR = CHR$

  READ = READ input
READLN = READ input to end of LiNe

COPY = COPYies part of string.
       Format COPY(STRING, START, LENGTH)

(* REM LINE *) same as REM statement

A:=1 same as A=1 in ATARI BASIC
```

BEGIN ; END ; anything between these two statements is executed as part of that statement/command/function or assignment. These Statements are associated with IF commands, FOR statements or any defined FUNCTION or PROCEDURE etc. See the (* INITIAL MENU PROGRAM *) and other programmes on the DRAPER PASCAL Disk for more details/examples. Also Read the DRAPER PASCAL Documentation on the Disk for more information.

PASCAL continued

Using PASCAL

If you would like to try and programme in some PASCAL without actually using PASCAL, then look no further than BASIC. TURBO-BASIC on the ATARI 8-BIT, FAST-BASIC on the ATARI-ST, AMOS BASIC on the AMIGA and BBC BASIC on BBC machines all have some PASCAL-like commands incorporated into their BASIC.

Some PASCAL-like Commands in various BASICs

IF / ELSE / ENDIF

WHILE / WEND / ENDWHILE

DO / LOOP / EXIT

REPEAT / UNTIL

PROC / ENDPROC / EXEC

SWITCH / CASE / DEFAULT / ENDSWITCH / ENDCASE

Using these commands will get you use to the idea of STRUCTURED PROGRAMMING. In PASCAL there are no GOTO line-numbers, therefore everything must be STRUCTURED.

PASCAL-3

Real-PASCAL

If you would like to use REAL-Pascal then remember that PASCAL is a COMPILED LANGUAGE. This means that you must first write the programme with a text editor (no line numbers), then COMPILE the programme and finally RUN the COMPILED programme. If you are using DRAPER PASCAL on the ATARI 8-BIT then it is advisable to have an ATARI 130XE so you can store the various programmes needed (EDITOR, COMPILER, MAIN CONTROL PROGRAMME etc.) on the RAMDISK, otherwise it could be a very time consuming exercise.

Learning / Using PASCAL

For learning and using PASCAL there are plenty of books on the market and probably a number of Public Domain or SHAREWARE PASCAL Languages available. On the ATARI 8-BIT there is DRAPER PASCAL (SHAREWARE), KYAN PASCAL and ATARI PASCAL.

PASCAL-4

How to COMPILE & RUN PASCAL PROGRAMMES

Press Key '3' (Compile Program option)

Type: HEX1 [RETURN]

"Default is E:" [Press RETURN]

(Program Compiles)

Press [SELECT] Console Key (menu option)

PASCAL continued

Press Key 'I' (Run Program option)

(Program NAME (HEX1)] (Press RETURN)

Follow Prompts

The two sample programs by Ralph are included on this issue disk . The files names are: HEX1.PAS, and HEX1.PCD which is the compiled version.

NEWS FROM THE U.S.A.

The following item is taken from CURRENT NOTES magazine May/94.

Branch Always announces PC XFORMER.

Branch Always Software the upcoming release of PC Xormer, a DOS compatible version of the Xformer series of Atari 8-bit emulators. With our eight years of experience developing Atari 8-bit and ST emulators, this emulator is by far the fastest and most compatible Atari 8-bit emulator available on any computer platform.

For the first time it is now possible to run Atari 8-bit software on the same computers that you run DOS and Windows software on, as fast or even faster than a real 8-bit computer. Imagine the ease of use and simplicity of using Atari Basic on a PC or even on a small notebook computer that you carry with you.

Hardware requirements are simple: a PC running MS-DOS (or a compatible operating system), 640K of RAM, a VGA card, and a 286 compatible CPU. This includes computers using the 386, 486, and pentium chips, as well as 286 emulators running on non-intel based PCs. A CPU at least as fast as a 33 Mhz 386 is recommended for full speed emulation.

Optional hardware not absolutely required (but recommended) includes: a sound blaster compatible sound card, a game card with two joysticks, and a hard disk. A Super VGA card is not required to run PC Xformer.

PC Xformer is a brand new PC DOS version of ST Xformer, the popular Atari 8-bit emulator for the Atari ST that first appeared in 1987 in ST LOG and more recently bundled with the Gemulator Atari ST emulator for DOS.

Unlike ST Xformer, which was limited in speed and graphics capabilities imposed by the ST hardware, PC Xformer has no such limitations when used on a fast enough PC. Player missile graphics are now fully supported, as are all GTIA graphics modes and display list interrupts. Vertical Blank and Display List Interrupts occur in real time, allowing for on-the-fly colour changes (and other animation tricks that were not previously supported in ST Xformer) allowing PC Xformer to run any Atari 8-bit software that you transfer to your PC.

To allow the usable playing of games that use timing loops instead of interrupts, at option in PD Xformer allows you to force it to "slow down" to normal speed.

NEWS continued

Or let it rip at maximum to get the most performance out of your Atari Basic programs.

As with ST Former the bank switched memory of the XL/XE is emulated, and Atari Basic can be toggled on and off. All popular 8-bit DOSes are supported, including DOS 2.0, DOS 2.5, MYDOS and disk based versions of SpartaDOS. Disk files are handled by using virtual disks, the same method used by ST Xformer, Gemulator, and most other emulators. Up to 8 virtual disks can be used at once, as drives D1: thru D8:.

Users of ST Xformer can directly use their existing virtual disk files (.XFD, .XHD, .SD or .DD files) with PC Xformer without modification. Users of the SIO2PC cable can also directly use their "ramdisk files" with PC Xformer without modification. Any size virtual disk is supported, from the standard 90K single density disk to a 16 megabyte hard drive.

Two PC style joysticks are supported using the game I/O card found in most PCs. Self-centering joysticks are recommended over standard analog joysticks.

Users wishing to receive more information about PC Xformer or to place an order should contact Derek Mihocka at Branch Always Software at the address or numbers listed below.

Also available from Branch Always Software: Gemulator 3.02- the Atari ST emulator for DOS compatible PCs. Turns a 486 based PC into an Atari ST clone with up to 8 megabytes of RAM and up to 800x600 colour SuperVGA graphics. Compatible with most non-MIDI Atari ST software and all versions of ST TOS up to TOS 2.6.

PC Xformer, by Derek Mihocka, will be available June 20 1994, from Atari 8-bit and PC dealers. Retail price: $39.95 U.S.

For additional information, contact Branch Always Software, 14150 N.E. 20th Street, Suite 302, Bellevue, WA 98007, U.S.A. PHONE: 206-369-5513; Fax: 206-885-5893. CIS: 73657,2714; GEnie: BRASOFT.

BELTING YOUR 1050.

The following item was taken from an article in Atari Classics magazine by Paul Alhart.

Recently a new problem has been showing up in 1050 drives with the World Storage drive mechanism. The drive belt keeps falling off for no apparent reason. When this happens the drive stops turning. Even though the busy light comes on and you can hear the motor turning, the drive won't read or write to any disk. If this is happening to your 1050, fear not, the explanation is fairly simple, and the fix is even easier.

In what I consider a design flaw, World Storage failed to include a belt retainer on their drive like Tandon did. This wasn't a problem when the drives were new. Now, however, a few years later, when the spindle bearings are starting to wear, it's becoming a problem for many 1050 owners.

BELTING-1050 continued

The slightest tilt of the spindle due to sloppy bearings causes the belt to track right off the edge of the pulley. Atari didn't switch from Tandon to World Storage drive mechanisms till near the end of 1050 production. This explains why the problem is just now starting to show up.

As I said, the fix is easy, and it won't cost you anything but a few minutes to make it. Just follow the procedure outlined below to add a belt retainer to your 1050.

Step 1: Disconnect the drive then turn it over and remove the six screws.
Step 2: Flip the drive back right side up and lift off the case.
Step 3: Lift the drive mechanism from the front.
Step 4: Locate the spindle pulley. If it's fully exposed you have a World Storage drive mechanism and should proceed with the fix even if you haven't had a belt problem yet.
Step 5: Cut a disk from the top of a plastic butter tub. Use a compass or drinking glass as a guide to make the disk about one quarter inch larger in diameter than the spindle pulley.
Step 6: Glue this plastic disk to the bottom of the spindle pulley. Hot-melt glue works really well for this.
Step 7: Re-install the drive mechanism by setting it down on its guide pins.
Step 8: Replace the top cover. The plastic disk acts as a belt retainer and should allow you many more productive years from your 1050.

DOS TIPS & TRICKS

Brought to you by Dive Master Sysop of: ATLANTIS BBS (305) 920-6203

HOW TO DELETE "TWIN" FILES

Have you ever ended up with two (or more) files on your disk with the same filename? Do you end up cursing and screaming when you try to delete one of them, then find that DOS has deleted BOTH of them? There is a way around that, folks:

1)Boot up DOS with BASIC in.
2)in the immediate mode, type
  POKE 3118,0
3)Type DOS, and press RETURN.

Now you'll be able to delete without losing both files, because by POKEing 3118,0 DOS will erase ONLY the first "twin" file. How about that?

SPEED UP YOUR DOS 2.0S

IF YOUR DOS 2.0S (and this will work for ANY DOS) seems to write very slow compared to other DOS's, that's because it has a WRITE VERIFY built into it. You can easily create a new version of the DOS, without the WRITE VERIFY built in. (Most of the time,you don't need it anyway - and some other DOS's give you the option of toggling it on and off).

DOS TIPS & TRICKS cont.

Here's what to do:

1)Boot up DOS with BASIC in.
2)in the immediate mode, type
  POKE 1913,80
3)Type DOS
4)Now, re-write DOS to your disk by using the Write DOS & DUP function of you DOS menu.

You have created a new DOS with the WRITE VERIFY turned off. It will write much faster now. COOL?

ARRRGH! ERROR- 164 AGAIN??!!

Awwww. You got an ERROR- 164 AGAIN?? Well, did you know you can still force DOS to load in the program anyway? ERROR- 164 means you have screwed-up da^a on your disk. If you have a LOT of garbage, you have a big problem. But what if only a little bit of your file got messed up, and you just KNOW you could fix it if you could just get the file to load? Well never fear, Do the following:

1)Boot in DOS with BASIC in.
2)in the immediate mode, type
  POKE 4148,234:POKE 4149,234
3)Now load in your program either from BASIC or from DOS.

You won't get ERROR- 164 now. And, you can fix that garbled program.....Ain't that just peachy, dudes?

IF YOU HAVE MORE THAN 2 DRIVES

Some DOS's (like SMART DOS) are built for systems with multiple drives, but many DOS's (2.0s, N-DOS, etc.) assume that you have ONLY 2 drives, which kinda cheeses you off if you just bought a third drive, and your DOS won't access it. Well, all you gotta do is the following:

1)Boot in DOS with BASIC in.
2)in the immediate mode, type
  POKE 1802,15
3)Type DOS
4)Re-write DOS to your disk with the DOS menu function that writes DOS and DUP.

Now you have written a new DOS that WILL assume that you have as many as 4 drives. That ought to do ya!!

CHANGE WILDCARD '*' TO .....

If you like to play around with DOS and want to change your wildcard character from * to something else, (and it's up to you as to just what that something else is), it's really pretty simple. Dig out your ol' manual that shows your ATASCII characters & values. You'll notice that the ATASCII value of the * character is 42. Now pick out whatever character you'd like to use instead, and look up its value.

DOS TIPS & TRICKS cont

For example, suppose you prefer the + character. You'll notice that the + character has an ATASCII value of 46. To make the change, do the following:

1)Boot in DOS with BASIC in.
2)in the immediate mode, type
  POKE 3783,46 (or the ATASCII value
  of whatever character you picked)
3)Type DOS
4)Re-write DOS & DUP using the DOS
  menu function that does so.

Now your new wild and crazy wildcard character is built right in!! NEAT??

MAKE Lowercase FILENAMES

Yes, fans, you CAN use lowercase letters for your disk filenames.You see that in MYDOS, right? Here's how you can do it with ANY DOS: If you look at the ATASCII codes, you'll see that the value of 0 is 48, and the value of lowercase z is 122. Do this:

1)Boot in DOS with BASIC in.
2)in the immediate mode type
  POKE 3818,48:POKE 3822,123
3)Type DOS
4)Re-write DOS to your disk with the
  write DOS & DUP menu option.

These pokes set in the parameters to accept ATASCII values in the file- names starting from 48 and ending with 122 (but the 123 you see above is correct). It's risky to go higher than 123, so just stick to what I told ya here. IT REALLY WORKS!!!!!

OPEN UP TO 7 FILES IN DOS

Have you ever noticed that you can have no more than 3 files open at one time in DOS? But ATARI allows you to have 7 files, so why not also be allowed to have all 7 of them open at once? This is a free country, isn't it? Well, it ain't so tough to do. If you want to be able to open more than 3 files at once, just do this:

1)Boot in DOS with BASIC in.
2)in the immediate mode, type
  POKE 1801,7
3)Type DOS

4)Re-write DOS & DUP to your disk
  with the DOS function menu.

A word of caution though. Each file that you allow open uses a 128-byte data buffer. So you shouldn't open more files (or reserve more space than you actually need). If, for example, you'll only need to open 5 files at once, then you POKE 1801,5. See how it works?

DOT-MATRIX DIGITIZER.

By Charles Jackson & Steven Chapman.

Taken from Antic Magazine April/1995.

Your Dot-Matrix printer can digitize photographs. The parts you will need should not cost you very much. With the accompanying program, you can create and store beautiful digitized GRAPHICS 9 pictures. Then you can use a picture editor to edit and print out your pictures.

To test whether your Atari has the right GTIA, type in and RUN the following; 10 GRAPHICS 9:GOTO 10. If your screen turns black, you have the correct GTIA chip. If it remains blue, you have the older GTIA chip.

As written, the digitizer program is for the Gemini 10-x printer. But we'll tell you how to modify the program for other printers.

However, first you must do a little bit of easy tinkering. Here's the hardware that you'll need;

+ TIL 414 Infrared phototransistor
  (Radio Shack 276-145 or equivalent).
* Female joystick port connector
  (Radio Shack 276-1538 or equivalent).
* BIIC-type pen cap
* 150-volt (at least) light source
* Several feet of cable wire, plus alumminium foil, paper clips and electrical tape.

THE LIGHT SENSOR

Assemble the digitizer circuit as shown in figure 1. If you own an XL computer, bend back the joystick port connector's metal flap or it won't fit.

The pen cap will hold the phototransistor, shielding it from heat and stray light. Cut off a half-inch from the top of the pen cap to form a tube. Slide the phototransistor into the pen cap (push it as far as it will go) and tape the wires to the pen cap's clip.

Seal the back of the pen cap with a small piece of electrical tape to keep out stray light.

Cut a small slit in a piece of electrical tape, and place it over the front of the pen cap. This slit acts like a glare guard for the phototransistor. Next, take a small piece of aluminium foil, wrap it around the pen cap and tape it in place. The foil prevents stray light from passing through the pen cap to the phototransistor. It also protects the phototransistor from much of the heat generated by your light source. Signs of an overheated phototransistor include random black spots on your digitized picture. Make sure the foil doesn't block the sensor's front slit.

PRINTER ATTACHMENT

Turn off your printer and unplug it. Remove the tractor feed unit and ribbon, and adjust the roller bars to press the

DOT-MATRIX DIGITIZER continued

Bend a paper clip into an "L" shape and attach it to the print head screw. (See figure 2.) Tape the light sensor to the paper clip. Position the sensor above the roller bar, at a right angle to the picture and about one-half inch away from it. Tape the sensor's wires to the print head. This will help the sensor stay in place while the print head moves.

DIGITIZING

Select a large black and white photograph with plenty of contrast. Portraits are best to start with.

We found that the digitizer didn't work well with glossy photos, so use a photocopy of any glossy pictures you want to digitize. The sample digitized illustration with this article was made from a photocopy of an 8 by 10 glossy photo of Sam Tramiel.

The digitizer will process an area measuring up to 5 1/3 inches high by 8 1/4 inches wide. Turn off the power to the printer and insert your picture as you would any piece of paper. Check the DIP switches on the rear of the Gemini. Switches 1-3 should be turned down and switch 4 should be up.

These switch settings tell the Gemini to ignore the "paper-out" detector, and to print the contents of the buffer and a linefeed every time it receives a carriage return code.

Position your light source above the photograph. Make sure the light sensor will not be "reading" it's own shadow.

Bright Fluorescent lights are preferable to incandescent lights because they provide an even, glare-free glow which does not radiate much heat. If a fluorescent light is not available, two or more incandescent lights should be used to ensure even lighting.

Plug the sensor in to the joystick port 1 and type in this one line calibration program:

```
1 PRINT PADDLE(0):SOUND 0,PADDLE(0),14,14:GOTO 1
```

Turn on your light source(s) and type RUN. The program prints light levels onto the screen while generating corresponding sound cues.

Light levels range from 0 to 228. Low numbers and high tones indicate bright light. High numbers and low tones correspond to dimmer light. Adjust the lights so that white areas of the photograph return high tones and low numbers, while dark areas return low tones and high numbers.

Turn on the printer, LOAD the digitizer program and type RUN. The computer will ask you for the filename under which your completed picture will be stored, and the type of digitizing process to be used. the "High Contrast" option uses a formula which normalizes light levels and increases the program's sensitivity to lighter areas.

The program must calibrate itself before digitizing your photo. Your computer will prompt you to put a white screen of card in front of the sensor, then a black screen of card. Once you've calibrated the program, press [RETURN] to begin digitizing and the printhead will move back and forth.

The computer requires 20 minutes to digitize a picture using the "Low Contrast" option. Pictures processed with "High Contrast" require 60 minutes. After about seven minutes, the screen will change colours and enter the "attract mode" to preserve the life of your picture tube. Press any key when you want to restore the proper colours to your screen.

HOW IT WORKS

Line 190 places the printer in condensed mode (136 characters per line). At line 250, the print head moves to the left column, advances the paper by 4/144ths of an inch, and tries to print a period. But the print head is already against the right margin, so it must do a carriage return before it can print the period. The carriage return and print instructions are stored in the printer's buffer. While the print head is returning to the left margin, the computer is free to perform other options, such as reading the light sensor.

Your original picture will not be harmed, because the printer does not actually print a period. Line 170 instructs the printer a downloaded character set. Since we haven't downloaded a character set, the printer prints blanks. As no characters are ever printed, the print head remains cool.

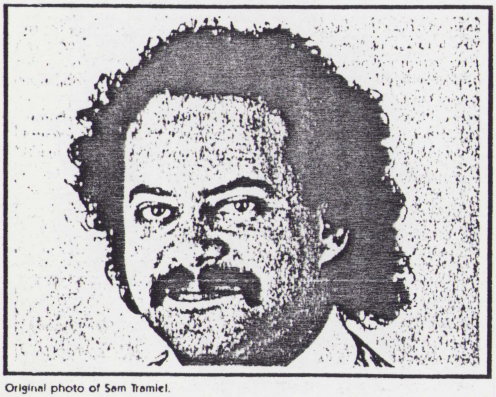
During each carriage return, the computer reads the light sensor 80 times; Once for each pixel in a GTIA screen scan line. The scanning loop routine lies in lines 260-280. Line 270 is an arithmatical delay which slows down the scanning loop. If this line were omitted, the scanning loop would be completed before the entire line could be scanned, and the digitized picture would be stretched horizontally.

A sound cue has been included to let you know when the computer is reading the light sensor. Use this cue to adjust the duration of the scanning loop when you use the digitizer with other types of printers.

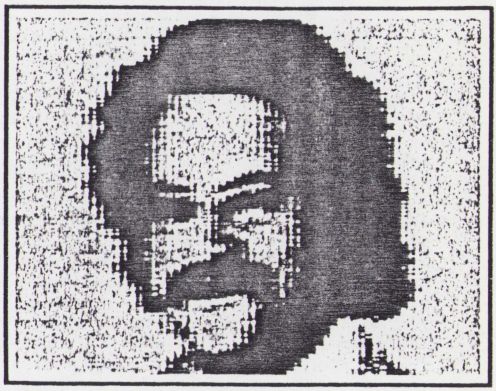
To use the digitizer with other printers, you must change the following control codes. If your printer has an adequate manual, it will chart the codes that control these functions below:

LINE	PURPOSE
170	Select the download character set.
180	Set the linefeed value to zero.
190	Put the printer in condensed mode.
200	Move the left margin to column one.
210	Ignore the "paper-out" detector.
229	Move the print head to the left margin.
250	Move the print head to the right margin then advance the paper by 4/144 inches.

DOT-MATRIX DIGITIZER continued



Original photo of Sam Tramiel.



Digitized photo of Sam Tramiel.

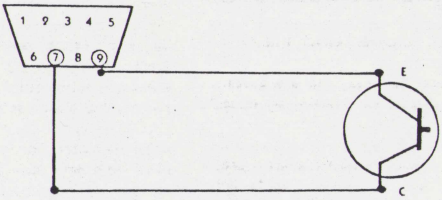


Figure 1

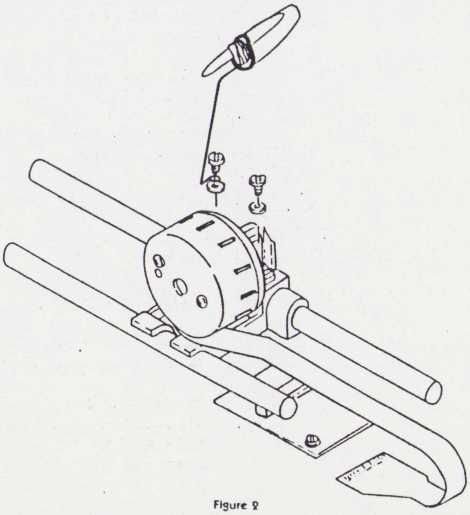


Figure 2

LETTER SECTION

Dear John/David/Max,

Congratulations on reaching double figures, I for one have no complaints to make, here's to another ten.

In regard to the letter from Andrew McIntosh and the grainy display on his 256XL. If his machine was made in Hong Kong the trouble probably lies in the modulator. According to the Ol'Hackers Newsletter of May/June 1993 (DMARMIN.TXT) these machine modulators were incorrectly built. A fix is possible, Ron Fetzer has the details, something to put into a future issue of TWAUG perhaps? In the meantime the modulator can be bypassed by using the monitor output. Connection can be made direct to the television if it has an appropriate composite video input such as a Peritel (SCART) socket. As my television has no such provision I connect it to my video recorder external input sockets, which work just as well and enables recording of the computer image if required. I hope this information is of some use.

Yours faithfully

Alan Hitchen

Dear TWAUG (John, Dave and Max)

Thanks for sending my copy of "The Complete and Essential Map" - it looks impressive. I'll pass on a few of my thoughts in the next few weeks.

On another matter, have you heard whether Gralin International is still in business. I have written to Colin Hunt on several occasions, enclosing stamped addressed envelopes, but I heard not a peep. He's as quiet as Les Ellingham and New Atari User.

Yours sincerely

Ray Pawson

Dear John, Max and David,

What can I say except "Congratulations" om the effort you put into each and every issue of your TWAUG newsletter. I have been in correspondance with one of your members (I wont mention his name - I'm sure he wouldn't like to be embarrassed!) for quite some time, but never did I realise that his recommendations would be so justified. Each issue I look forward to sending off my money (or should that be "I look to receiving the newsletter"?!) - there's always something that interests me. The disk contains top quality material, and spelling/punctuation is usually very good. The overall feel is that you're onto a winner!

Could I also take this opportunity to congratulate both TWAUG and Andrew Thompson for the new book "The Complete and Essential Map" - almost certainly the most comprehensive book to be released for our favourite machine.

From one of your many Atari friends,

Kevin Cooke

Dear David, John and Max,

Please find enclosed my PD order and also my Annual Subscription Renewal.

Incidentally, I had a terrible job finding out how much the renewal Subscription fee was. I looked through all your newsletters, also numerous Page 6, but could find no reference to it. I had almost resigned myself to enquiring by letter, because I don't want to miss a single issue, but then I had a brainwave - I looked through my "letters file" and there was your original giving me all the details.

To avoid future problems (and I'm sure there must be countless others like me) could you not find an odd corner in every Newsletter stating your annual subscription rate? Also, how about a countdown number on our address labels (like the Page 6 system) to alert members when they need to renew. It would be more work for you, no doubt, to keep your membership database updated but would simplify matters this end.

Please don't think that the foregoing is in anyway a criticism. I fully appreciate your efforts in compiling the magazine, (it's taken me ages just to compose this letter!), and I eagerly await every issue. Long may you continue.

In Issue 10 you ask whether all listings should be put on the disk. Personally, it really doesn't matter because I have 1050 drives but, as it will obviously create more work for yourselves, I say leave it as it is. After all, the listings that appear in the Newsletter are always very short so there's no reason why members can't type them in themselves.

Best wishes to the three of you. Looking forward to Issue 11 and, hopefully, 111.

Sincerely, Dennis Fogerty.

EDITORS REPLY

Let me first of all thank you very much for your lovely letters, we appreciate these kind of letters very much.

Now to answer a couple of queries.
Ray Pawson is wondering if Gralin International is still in business, at the present moment we are as much in the dark as you are.

LETTER SECTION cont.

And now the problem of Dennis Fogerty about the subscription fees and countdown numbers on the address labels.
The annual subscription rates will be included in each issue from now on. David has informed me that he does enclose a new subscription form in the final issue when the subscription runs out, or he mails a new form separately just shortly afterwards. The database he's using gives him the starting date and final issue date for each subscriber.

Dear Dave,

Thanks for the reminder I am quite happy to renew my subscription for another 6 issues. I had intended to write to TWAUG's letter page, but time seems to run out and the ATARI users keep me busy repairing disk drives and computers. So I will ta e this opportunity to say, well done TWAUG, keep up the good work. I look forward to the arrival of each issue, but I have only one complaint, the print is so small I have trouble reading it. One day I will find time to obtain some new glasses.

You may print this letter in your mag if you wish. Page 6 printed some letters from me a few times and the repairs have not stopped coming, so please feel free to include my address.

Thanks again for a good mag, all the best,

Sid Berry
17 Pond Road
Ashford, Kent
TN23 4QX

EDITORS REPLY

The reason for keeping to the A3 size is simply to keep the cost down. If we produce a newsletter in A4 size, I have no doubt the cost for the newsletter would have to go up and we are trying to keep it as low as we can, we don't want to loose any of our subscribers.

There are quite a number of our members out of work and therefore every penny counts for them. Why not let our members tell us what they would like. You see we had been toying with the idea of an A4 size newsletter, but weighing up the cost we thought different about it and it doesn't look as good as our A3 size. Let TWAUG know what you think of Sid's idea. Would you want the newsletter in larger print, that means in A4 size and have a higher subscription fee, or keep it as it is!!!

Well Sid if you are doing repairs on drives and computers I would imagine you need good eye sight and therefore my suggestion would be to invest in some new specs. HA!HA!HA! I wear spectacles myself and I have no problems reading the newsletter.

Dear David,

First of all I would like to thank both, you and the rest of the staff at TWAUG. I am writing this letter hoping that you will publish parts of it in your fantastic publication of TWAUG.

During these last few weeks I have stopped using the Amiga and I have started using the MINI OFFICE II both for my personal use and for work as well.

But first I must tell you that I've completed THE HALLEY'S PROJECT. I am now going to list the planets in our solar system plus their orbiting natural satelites. I am going to start with the planet which is nearer the sun to the one which is furthest away.

Mercury:- none
Venus :- none
Earth :- Moon
Mars :- Phobos, Deimos.
Jupiter:- Ganymede, Io, Europa, Callisto, Amalthea.
Saturn :- Titan, Dione, Tethys, Rhea, Iapetus.
Uranus :- Arial, Titania, Miranda, Oberon, Umbriel.
Neptune:- Triton, Neried.
Pluto :- Cheron

When I finished all the levels I got a personal ID Number 459,072. Now some comments about this game. Phobos and Deimos are very difficult to land on as they are very small. Iapetus and Umbriel are difficult to find. One of these is 3 million kilometers from it's planet. I never found Neried I got this from one of the Astronomy books that I read recently. Anyone who gets stuck on this program can write to me.

I have some problems with the Database program in Mini Office II. The two programs that I use quite a lot are the Database + Utilities and the Word Processor. First I format a disk in medium density and put the Database plus Utilities on side A of the disk together with the Word Processor, there is lots more room for other files. When I create a file in Database I have to make it larger than the amount of entries I require. The problem I've encountered is during the Sort procedure. Most of the time I create and use the Database file in Drive 8, when I try to do the sort with the exact number of records that are available and the records that I entered the program tells me to reboot the Database disk which I can't since I am using the Ramdisk. So to get round this problem I always create a data file larger than the amount of records that I need, this eliminates the problems during the Sort.

The second problem with Database is, when I copy a Data file from a drive to the Ramdisk or vise versa than the records get corrupted. I am sending you my Data file of Utility list on the disk, so that you can check this out.

LETTER SECTION cont.

I left the record XL BOOT MAKER as it is. See if you can edit it and copy the Data File to another disk or to the Ramdisk, please let me know what you get. I will look forward for this result in the Publication of TWAUG.

I am looking forward for the next issue of TWAUG. I've just received issue number 10. I hope to write something about Transdisk I & IV for the next issue. Can you do a Review on the Yorky 256K expansion that is being sold in the UK?...

John.

DAVID's REPLY

Thank you for your letter John, and welcome back to the 8-bit scene.

With regards to your problem with Mini Office II, I have tried out the data file that you sent, and as you say, one of the records is corrupt. I think the problem is that unfortunately there are a few bugs in Mini Office and one or two of these are in the database section.

I have spoken to other users of Mini Office, and they have also had the same problem as you. I do not know if anyone has produced a fix to sort these bugs out, may be one of our readers will be able to give you help with this problem. If anyone can help John, then please get in touch with him. His address is:

Mr. J. Mizzi.
107 ST. Joseph Street,
Zabbar, zbr 05, Malta. g.c.

Dear TWAUG,

Future articles are dependant on input. My and I suspect many others', biggest problem in starting an article is selection of a subject. I believe that if readers would respond with questions and feedback, there would be far more submissions to all newsletters.

I just finished reading issue 10 of the TWAUG newsletter. It is not the first one I've seen but I continue to be impressed by the amount of effort that so obviously goes into it. I will definitely save a copy of the Black Box article by Max Gerum. I don't have or plan to buy one but, periodically our SysOp asks me for m/l coding to support his. Max' article is the most information I've seen on the BB in one place and is greatly appreciated.

One question does arise concerning the advertisement on page 24: How do you send anything to Australia, Canada, the US, or anywhere else for that matter, from the UK "overland" and keep it dry? - I just couldn't resist.

In issue 10, Andrew McIntosh posed several questions regarding a 256XL. As an owner and programmer of one such beast, along with 320K and 1088K XE's, I offer further information to address his queries.

GRAPHICS QUALITY: To start off, the XL/XE power supply was only designed for 64K and extra RAM takes power to maintain and refresh. More power is lost to items hanging off the ports such as disk drives, printer interface, keypad, etc. If your power supply is weak or failing, usually the first thing to go is video quality. Possibly you need a replacement or a rebuild. The fastest way to check this is to swap the existing ones. Then, verify all cables and connections starting with that to the TV. Believe it or not, something like a faulty joystick or SIO connection can cause problems in what appears to be a completely unrelated area.

A composite monitor will give a beter picture than a television but if you're stuck with using the RF output, it can be tuned. Open the computer and remove the RF shielding. The RF modulator is a small metal box in front of the jack for the TV cable with two holes in the top. One gives access to the video tuning coil and the other, the audio. While running a graphics and sound program, you can adjust (more "tweak" than adjust) the coil slugs, with a non-metallic screwdriver for best video and audio. DO NOT GET OVER-ENTHUSIASTIC as it takes very few turns to run the slug right through the coil (getting it back in is a supreme pain-believe me I know). Also do not use a lot of force as the slugs are fragile (as a friend found out).

RE-BOOTS: With any expanded memory computer from the 130XE on up, you have to leave the power off for up to 15 seconds to clear the RAM. In effect you must wait for the charge to bleed off the extra memory which is essentially a bunch of capacitors. This is not required for main or "normal" RAM as the OS clears all but the first eight bytes it finds (40 or 48K depending on BASIC) as part of the boot process. However, the OS has no idea that anything beyond 48K ever existed.

If you use something like MYDOS with DUP in the RD and flick the power off and on quickly, the computer will boot and DOS may find DUP in the RD directory and attempt to run it from RD. Just because the directory appears intact, there's no guarantee that the DUP file is, as its RAM may have been refreshed much earlier than the bank holding the directory and therefore have lost enough charge to not survive the power interruption. By the way, the correct address for a soft boot is $E477.

DISASSEMBLERS: Depending on whether you want to disassemble from memory or disk there are several good programs available on the ANALOG magazine disks, all written by Barry Kolbe and Bryan Schappel. For disassembly of RAM or ROM, the BBK Monitor and Debug are both good. For disassembly of a disk (sectors or file), DiskMaster is excellent and even includes equates for many OS locations.

LETTER SECTION cont.

A real advantage in these programs is that all were released with complete source code. Therefore they can be modified as desired and reassembled at different addresses so you can do things like examine a cartridge. Note that all three programs can direct output to a disk file and all work with SpartaDOS as well as DOS 2 and clones like MYDOS.

Hope this helps,

John Picken
VICTORIA, CANADA

EDITORS REPLY

Thank you for your comment on the Black Box, it has really made my day. The idea in explaining a subject is to make sure a beginner can understand it. I remember when I started computing, a lot of the instructions didn't make any sense at all.

Well John, when we dispatch the mail "OVERLAND" we seal it in a plastic bag so it doesn't get wet. HA!HA!HA! I bet you didn't expected that.

Dear David/John/Max,

Thank you for the speedy despatch of The Complete and Essential Map. Unfortunately I have not had the time to study it in depth as yet, but here in my immediate impression of it.

Firstly I was slightly surprised by the format. I was expecting one A4 size volume not two in A5. However, the layout was good for the size of the work. As a very poor Basic programmer perhaps this is not the ideal book for me as I found the map volume somewhat dry to read and was over my head at times. The entries I could understand were very imformative, and no doubt this information is invaluable to the machine code programmer.

The appendix volume was rather more easy to get to grips with and has even more useful information, tips and programs. Though again some of it was rather esoteric for me. I was rather intrigued by the suggestion that the built-in Operating System could be replaced by one for another computer in order to use its software. In this regard I believe that the Oric range, as well as some other computers that were not mentioned used the 6502 processor, whereas the Dragon models used the Motorola 6809E.

Overall I thought the book was a very worthy project that deserves success.

Further to my last letter I enclose a wiring diagram for a monitor output to SCART input lead. Ideally miniature co-ax cable should be used for the video connection and shielded cable for audio. However, I find that shielded audio cable works well for both connections in my own set up, which uses phono connectors instead of the SCART. I hope this is useful.

Yours sincerely,

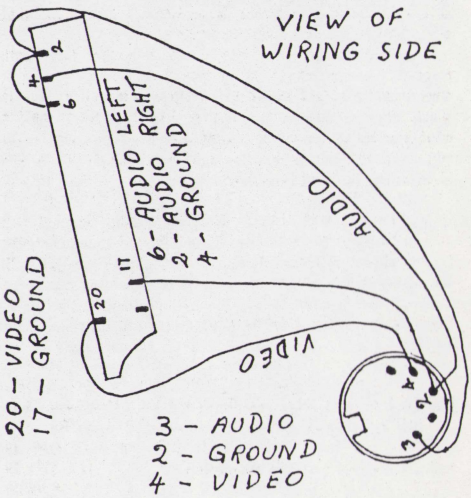
Alan Hitchen

EDITORS REPLY

I am sorry you were dissapointed with the book size. We had quite a good feedback from the subscribers who placed a book order before it was publish, the book they preferred was an A5 size in two volumes. This smaller size is easier to handle and being in two volumes much easier to check the maps with the apendices.

There is one other factor, the cost. An A4 size book would have been much dearer, it would have had the same amount of pages and we would have made it into two volumes. But with the same amount of pages in an A4 size would have ment twice the amount of paper of an A5 size. We also looked at the weight for mailing, there again we would have had dearer postage to pay.

SCART DIAGRAM



CRACKING THE CODE

by Keith Mayhew

Re-printed by M. Gerum

This article first appeared in "The UK ATARI Computer Owners Club" later renamed "MONITOR"

Part 11

Player/missile priorities and the special GTIA modes are discussed this time, followed by a look at how display list interrupts are used and why they are useful.

PLAYER/MISSILE PRIORITIES

As mentioned last time, the register PRIOR has four bits which determine how players and their missiles are displayed. To select a particular priority scheme one of these four bits should be set; the priorities for these are shown in Figure 1.

For example, if bit 1 was set in PRIOR, then from Figure 1 we can see that player/missiles 0 and 1 will always appear over all playfield colours and that player/missiles 2 and 3 will disapear behind all playfied colours and will only show above the background colour.

No matter which priority has been selected, if any two player/missiles overlap then the one with the lower number will be displayed, ie, be on top, assuming, of course that bit 5 hasn't been set in PRIOR to enable a third colour in the overlap region. The playfield colours obviously cannot overlap so their respective priorities is of no consequence unless a fifth player has been created out of the four missiles. In this case the fifth player,referred to as P5 in Figure 1, takes the colour of playfied 3 (COLPF3 not COLPF0-3 as stated last time -sorry!). The fifth player can be placed to coinside with other playfield colours and in these cases it will always disappear behind them. Figure 1 also shows that everything will appear over the background.

If more than one priority is selected then both priorities will be obeyed when they agree, however, if one says that the object should be on top and the other says it should be under, the overlap region will turn black no matter what colours are selected. Having all four priority bits set to zero is something which I have never seen documented, but it does have an interesting effect. It seems to act as if bits 1 and 3 in PRIOR had been set but the conflict regions don't turn black but take the colour obtained by ORing the two overlapping colours together. If you are not sure about these priorities then the best thing is to set up some players on the screen and experiment.

COLOURS AND SHADES

To recap, there are a total of nine colour registers in the hardware, they are COLPM0-3 for player/missiles, COLPF0-3 for playfields, and COLBK for the background. Their respective shadows are PCOLR0-3, COLOR0-3 and COLOR4.

All of these registers use their top four bits to specify one of sixteen colours and their lower four bits to specify a luminance. Bit 0 of the luminance is not actually used so there are only eight luminances available.

The association of the playfield and background colours to the data being displayed by ANTIC will now be described, with the exception of the character mapped modes which will be dealt with next time.

The background colour, COLBK, is always visible whenever ANTIC is not displaying a mode line, usually at the left and right edges of the screen and at the bottom. The background colour will also always be displayed during 'blank' instructions in a display list, for example at the top border. This rule applies for all ANTIC modes.

Of ANTIC's eight bit-mapped modes, mode 8 through $E all display the background colour if the pixel being displayed is 0, if the pixel is 1 then it uses COLPF0, if it is 2 then COLPF1 and if it is 3 then COLPF2 is used. The pixel's value refers to either a one or two bit field depending on whether a two or four colour mode is being used.

In mode $F, GRAPHICS 8 from BASIC, the register COLPF2 is used whenever the pixel value is 0 producing a new 'background' with COLBK showing as a border. When the pixel value is 1 the colour is still specified by COLPF2 but the luminance value comes from COLPF1. If players are displayed in this mode then their priorities only refer to COLPF2. However, when the player does appear on top of COLPF2 then if the pixel value is 1 the data is still shown 'through' the player using the player's colour and COLPF1's luminance! This strange set-up is used in two of the character modes as we will see next time.

GTIA MODES

The top two bits of PRIOR determine how GTIA displays the data given to it by ANTIC. Both bits set to zero provides the normal mapping of colours to data; we shall now consider the other three modes available. Although these modes can be used with any ANTIC mode the effects are rarely useful, the following descriptions will assume that ANTIC mode $F is being used. This will use four bits for each pixel producing 80 pixels across a standard screen.

With bit 7 set to 0 and bit 6 set to 1 there are sixteen luminances available of the background colour, COLBK, assuming that its luminance has been set to zero. The pixel value determines the actual luminance. This mode is used for BASIC's GRAPHICS 9.

With bit 7 set to 1 and bit 6 set to 0 there are nine independent colours available. The background colour for this mode comes from COLPM0, ie, pixel value 0. As the pixel value increases, the registers used are, in order: COLPM1-3, COLPF0-3 and COLBK. Higher pixel values re-use some of the registers.

This mode is used for BASIC's GRAPHICS 10.

With bits 7 and 6 set to 1 there are sixteen colours of one luminance. The colour is determined by the pixel value and the luminance is taken from COLBK. The background colour, COLBK, is always displayed at luminance level zero. This mode is used for BASIC's GRAPHICS 11.

INTERRUPTS

Interrupts are generated by the hardware of the ATARI and can cause the 6502 to execute an interupt routine. When the routine finishes the code being executed by the 6502 continues as before.

CRACKING THE CODE continued

An interrupt is therefore very similar to a subroutine except that it can be called at any time independant of the code being executed.

There are three different types of interrupt on the 6502, they are interrupt request or IRQ, non-maskable interrupt or NMI and a 'software' interrupt.

An IRQ will only be acted upon by the 6502 if its 'I' flag has been cleared by the CLI instruction. An NMI will always be acted upon because it cannot be masked like an IRQ, hence its name. A BRK instruction when executed acts like an interrupt, hence it is termed a software interrupt.

All interrupts save the processor state on the stack before the interrupt routine is started. Exit from the routine is performed with the RTI instruction which pulls the processor state back and returns to the place it was at just before the interrupt occurred.

The program in Listing 1 is used to modify the display list of one of BASIC's GRAPHICS 9, 10 or 11 modes. It replaces six of the mode $F lines with mode 2 lines and then moves the jump on vertical blank instruction so that it occurs 42 instructions earlier than it used to. The reason for this is that the screen had been extended by the mode 2 lines which create eight scan lines each; if the display had not being shortened then the screen would have started to roll. before making any changes to the display list.

ANTIC's DMA is disabled so that it does not try to execute the display list while it is being changed, the display list DMA is turned on again when all the changes have been made. If this method had not been used then the screen would have become unstable for a short while .

The only problem is that inserting the mode 2 lines with one of the special GTIA modes on means that the text will not be displayed as normal. The solution is to set the display list interrupt flag in two places in the display list. The first is on the last mode $F line before the mode 2 lines and also on the last mode 2 line. With these flags inserted in the display list two NMI's will be generated during every scan of the picture. All that is needed now is to turn off the GTIA mode on the first interrupt and restore whatever mode was in use on the second interrupt.

The address of the interrupt routine called DLICODE in Listing 1 is saved into VDSLST and VDSLST+1. The interrupts don't actually occur though until $C0 is saved in NMIEN after the display list has been set up. This value enables both vertical blank and display list interrupts (VBI and DLI respectively). A vertical blank interrupt is set up in the program to set the value of COUNT to zero at the start of each scan of the picture. This is used so that the DLI can differentiate between the first and second interrupt down the screen.

The very first thing the DLI routine does is to save the accumulator value on the stack so that it can be restored at the end. This is necessary otherwise it would affect the code it had interrupted.

If the value of COUNT is zero then it is the first interrupt and it loads the value of GPRIOR and masks off the hardware register. Before returning it increments the value of COUNT so that on the next interrupt it will load the value of GPRIOR and save it back in PRIOR hence turning the GTIA mode back on.

The value of COUNT will be reset to zero at the next vertical blank so that the DLI continues to behave correctly.

It is important to remember that the hardware register itself is changed by the DLI so that it takes immediate effect. Even if the value of the register is not restored to its previous value then the next vertical blank will ensure that the value in the shadow is transferred to it. This is why that, when ANTIC's DMA is being turned off, the value is stored in both the shadow and the hardware register on lines 460 and 470.

What has not being explained so far is why there are write instructions to the register WSYNC on lines 880 and 920 in the DLI code. After a write to WSYNC the 6502 is halted until the current line has finished being displayed, this is known as horizontal synchronisation or blanking. If this was not done then the change to PRIOR might take place somewhere in the middle of the line, writing to WSYNC ensures the following instructions take place while the beam is returning for the next line analagous to the vertical blank.

A problem which might be encountered with DLI's is when using them with the operating system key click routine, as this uses WSYNC to generate a delay. The problem is that while the click is being produced the DLI might be delayed by a line due to WSYNC freezing the 6502 when the interrupt occurs. Usually the best thing to do is not to use the O.S. keyboard routines, otherwise you can generate your DLI a line earlier and use the register VCOUNT to determine when you have reached the desired line. VCOUNT keeps a track of the current scan line number to two-line resolution, ie. it counts only even scan lines as the least significant bit is missing.

If you write a program which depends on timing for correct operation then you can inspect the register PAL which bits 3, 2 and 1 set to 0 for a PAL machine and to 1 for an NTSC machine. PAL is the European video standard which runs at 50Hz while NTSC, the American standard, runs a 60 Hz. In fact it is not just the display which runs faster on an NTSC machine the processor also runs faster.

Listing 2 is a BASIC program which loads the machine code of Listing 1 into memory and runs it on a GRAPHICS 9 screen.

We will continue next time with a study of character mapped modes and horizontal and vertical scrolling. In the meantime you might like to put DLI to good use for things such as changing colours of playfields or players somewhere down the screen. If you change the colour of every scan line of GRAPHICS 9 you could display all 256 colours and shades. You could even reposition players at different places on the screen making it look as if you have created more players.

CRACKING THE CODE continued

PRIOR bit number :-	3	2	1	0
Highest priority →	PF0	PF0	P0	P0
	PF1	PF1	P1	P1
	P0	PF2	PF0	P2
	P1	PF3/P5	PF1	P3
	P2	P0	PF2	PF0
	P3	P1	PF3/P5	PF1
	PF2	P2	P2	PF2
	PF3/P5	P3	P3	PF3/P5
Lowest priority →	← BACKGROUND →			

Note :- Priority is selected by setting the appropriate bit in PRIOR.
PF refers to playfield colour.
P refers to player / missile colour.

Figure 1.

```
0100 ;Hardware registers...
0110 PRIOR   =      $D01B   ;Priority and GTIA mode.
0120 DMACTL  =      $D400   ;DMA control.
0130 WSYNC   =      $D40A   ;Wait for horizontal sync.
0140 NMIEN   =      $D40E   ;NMI enable.
0150 ;Operating system vectors...
0160 VDSLST  =      $0200   ;DLI vector.
0170 SETVBV  =      $E45C   ;Set vertical blank vector.
0180 VBI2    =      $E45F   ;Stage two vertical blank.
0190 ;Operating system shadows...
0200 SDMCTL  =      $022F   ;DMA control.
0210 SDLSTL  =      $0230   ;Display list pointer low.
0220 SDLSTH  =      $0231   ;Display list pointer high.
0230 GPRIOR  =      $026F   ;Priority and GTIA mode.
0240 ;Display list instructions...
0250 JMP     =      $01     ;Jump instruction.
0260 WVB     =      $40     ;Wait for vertical blank flag.
0270 DLI     =      $80     ;DLI flag.
0280 ;Page zero variables...
0290         *=     $CB
0300 PZERO   *=     *+2     ;Used as a pointer.
0310 COUNT   *=     *+1     ;DLI count.
0320         *=     $0600
0330         PLA
0340         LDY    #VBI&$FF ;Set VBI vector.
0350         LDX    #VBI/256
0360         LDA    #6
0370         JSR    SETVBV
0380         LDA    #DLICODE&$FF ;Save new DLI vector.
0390         STA    VDSLST
0400         LDA    #DLICODE/256
0410         STA    VDSLST+1
0420         LDA    #0      ;Zero DLI count.
0430         STA    COUNT
0440         LDA    SDMCTL  ;Turn off ANTIC DMA for
0450         AND    #$DF    ; display list.
0460         STA    SDMCTL
0470         STA    DMACTL
0480         LDA    SDLSTL  ;Copy display list pointer.
0490         STA    PZERO
0500         LDA    $DLSTH
0510         STA    PZERO+1
0520         LDY    #22     ;Position in display list.
0530         LDA    #$F+DLI ;Turn on interrupt.
0540         STA    (PZERO),Y
0550         LDA    #2      ;Mode 2 line.
0560 LOOP1   INY
0570         STA    (PZERO),Y ;Save in next position.
0580         CPY    #27     ;Five lines stored?
0590         BNE    LOOP1   ;No, loop back.
0600         INY            ;Next position.
0610         LDA    #2+DLI  ;Mode 2 + interrupt.
0620         STA    (PZERO),Y
0630         LDY    #157    ;New position in display list.
0640         LDA    #JMP+WVB ;Jump on blank instruction.
0650         STA    (PZERO),Y
0660         INY            ;Now copy display list
0670         LDA    PZERO   ; pointer as jump address.
0680         STA    (PZERO),Y
0690         INY
0700         LDA    PZERO+1
0710         STA    (PZERO),Y
0720         LDA    SDMCTL  ;Restore ANTIC DMA for
0730         ORA    #$20    ; display list.
0740         STA    SDMCTL
0750         LDA    #$C8    ;Enable interrupts.
0760         STA    NMIEN
0770         RTS            ;Return to BASIC.
0780 ;Vertical blank interrupt...
0790 VBI     LDA    #0      ;Zero DLI count.
0800         STA    COUNT
0810         JMP    VBI2    ;Exit to O.S.
0820 ;Display list interrupt.
0830 DLICODE PHA            ;Save accumulator.
0840         LDA    COUNT   ;Get DLI count.
0850         BNE    ON      ;Not zero, turn on GTIA mode.
0860         LDA    GPRIOR  ;Turn off GTIA mode.
0870         AND    #$3F
0880         STA    WSYNC   ;Wait for sync.
0890         STA    PRIOR   ;Save new mode.
0900         JMP    DLIEND  ;Exit.
0910 ON      LDA    GPRIOR  ;Restore old value.
0920         STA    WSYNC   ;Wait for sync.
0930         STA    PRIOR   ;Save value.
0940 DLIEND  INC    COUNT   ;Increment counter.
0950         PLA            ;Restore accumulator.
0960         RTI            ;Return from interrupt.
```

Listing 1.

CRACKING THE CODE cont

```
QZ 10 DIM HEX$(16)
CV 20 LINE=10000:TRAP 100:J=0:START=1536
VA 30 READ HEX$,CHKSUM:SUM=0
AA 40 FOR I=1 TO 15 STEP 2
ZG 50 D1=ASC(HEX$(I,I))-48:D2=ASC(HEX$(I+
   1,I+1))-48
KT 60 NUM=((D1-7*(D1>16))*16+(D2-7*(D2>16
   )))
LW 70 SUM=SUM+NUM:POKE START+J,NUM:J=J+1:
   NEXT I
LY 80 IF SUM=CHKSUM THEN LINE=LINE+10:GOT
   O 30
IN 90 ? "Checksum error on this line:"
VO 95 LIST LINE:END
YS 100 PRINT "Data in memory."
XE 110 GRAPHICS 9
CV 120 X=USR(1536)
ZV 130 FOR I=0 TO 79
WM 140 COLOR I*15/79
FK 150 PLOT I,0:DRAWTO I,17:PLOT I,24:DRA
   WTO I,191
GD 160 NEXT I
CR 170 POSITION 0,18:POKE 87,0
OG 180 END
OF 10000 DATA 6BA05FA206A9062D,734
FG 10010 DATA 5CE4A966BD0002A9,903
EZ 10020 DATA 06BD01D2A900B5CD,657
KO 10030 DATA AD2F0229DFBD2F02,676
NT 10040 DATA 8D00D4AD300285CB,912
MW 10050 DATA AD310285CCA016A9,912
KW 10060 DATA 8F91CBA902C891CB,1210
WH 10070 DATA C01BD0F9C8A9B291,1320
SJ 10080 DATA CBA09DA94191CBC8,1302
FO 10090 DATA A5CB91CBC8A5CC91,1430
XX 10100 DATA CBAD2F02092008D2F,654
HT 10110 DATA 02A9C008D0ED4608A9,995
NA 10120 DATA 00B5CD4C5FE44BA5,974
NT 10130 DATA CDD00EAD6F02293F,817
IU 10140 DATA 8D0AD4BD1BD04CB2,945
WM 10150 DATA 06AD6F02BD0AD4BD,796
GS 10160 DATA 1BD0E6CD6840,838
```

Listing 2.

CONTENT

Side A of this issue 11 disk has another good selection of programmes for you to enjoy.

There is a game called Medival Combat. It is a game for two people, you can either use the joystick or keyboard. The game begins with you and your opponent choosing your strategies by placing your armies. Well I better leave it to you, by the way the instructions are on the disk, under the name of MDCOMBAT.DOC.

The Menu Planner program is what it says, you can plan your full week meals ahead with this programme. I haven't tried running this programme, but I should imagine it is very easy to follow. No instructions available, but when you run this programme a menu is displayed that lets you read the Menu Plan on the disk, it gives you the ingredients you need to buy.

Virus Scanner is a programme to scan for any virus on your 8-bit. This programme is very handy when receiving disks and you're not sure if they are affected with a virus. Apparently there are some disks in circulation with a virus. Again full instructions are on the disk.

Super Pack, I am afraid I cannot tell you much about this programme, you must read the instructions to get to know it. It is a lengthy text, the best would be to make a printout, the filename is SUPERPCK.TXT.

On page 8 in this issue is an article about the Pascal language by Ralph Bradley, this text gives you all the instructions on how to use the programme HEX1 on the disk. Again as in the previous paragraph, I am unable to tell you anything about it. I haven't got the language Pascal to load into memory to be able to run HEX1.

When you run MAX HEADROOM, on side A you will be requested to flip the disk. Just turn the disk over and follow the prompt. This is a demo of MAX moving his head from side to side.

On side B also is the Codesmith Newsletter Reader, in short 'CNR'. A menu is displayed from where you can view some digitized pictures and/or read the instructions for this programme. You could also use a wordprocessor to read the Tutorial text on the same side of the disk.

ERRATA

In the letter section in issue 10, Andrew McIntosh wrote and I quote, "by typing 'M: run address' and entering ('E741') etc., this is an error, it should read 'E471'. Thank you Mark Watson for writing and pointing out the mistake to us.

GAMES REVIEW

by Mark Fenwick

SEXVERSI

Sexversi from Mirage Poland, distributed through A.N.G. is a puzzle game with quite a difference.

Once loaded the title sexversi appears in bold 3D letters with the credits flipping beneath, while a lively background tune plays away. Once the credits have finished the option screen appears, set out a little like Zybex's intro with a cross hair moved via the j/stick to select. You have the choice of playing against the computer or an opponent, in either case you may enter your name if desired. Once you've decided on your options and selected start with your cross hair the game begins.

Where does the sex come in? you're thinking... On selecting start the screen moves to another screen, split into four equal pieces, each piece shows the head and shoulders of pretty ladies. Moving the cross hair and pressing fire determines which of these lovelies you'll see later! On your selection you're then shown the whole picture masked and split in to sixteen squares with only the head and shoulders you selected displayed. Another square revealing another part of the picture flashes to indicate which piece will be uncovered should you win that particular round. It's from here that your game begins.

The play area is split in to an 8 by 8 grid with the right hand side showing your name and opponents name as well as number of tiles turned. The centre of the grid shows your pieces. When the cross hair comes in to view, simply move it to the desired square and press the fire button to place your piece. Movement is very smooth and there's no mistaking the bright coloured pieces. A screen prompt will appear should you try to place a piece in the wrong place, however, unless you've got a Polish phrase book handy then this is of little use!

Playing Sexversi is relativly simple, the main object is to gain as many pieces as possible. This is achieved by trapping your opponents coloured pieces in between your own in a vertical, diagonal or horizontal line. Playing the computer is quite challenging in itself as the reaction time for the computer is very quick indeed!

When a round is won by either party, press fire to take you to the picture screen, here the square that was previously flashing remains uncovered. Before returning to play, another square will flash to indicate which will be revealed on the next successful game. Obviously you can't win them all, as they say, in which case losing a game will result in playing a game for the previous square, so it could be some time before you see the whole picture!

The game is well put together, nice introduction followed by an addictive gameplay. The addition of the nude models adds that bit more of a challenge as you strife to expose them fully.

I should point out that though these pictures are nicely drawn they are not digitised and not really to be considered as pornographic but more as an amusement. The pictures are of a quality seen in Strip Poker from Artwork. It wouldn't really be a wise choice for the younger player as embarrasing questions could crop up like, daddy what's that?

Overall the game is well put together and has a strong addictive quality about it. A good deal of colour and well defined graphics have made such a simple game worthwhile to look at. The disk comes nicely packed and includes an English instruction sheet, though many of you will have played this game before in one shape or another and if you haven't you'll soon get to grips with it. Sexversi is available from none other than Micro Discount at a price that won't break the bank of £5.95. Well worth it too!

HANS KLOSS

Who says there's no new quality software for your 8-Bit? Hans Kloss from Avalon of Poland says quite the opposite. As with most of the New games from Poland all screen text is in Polish. However there is an English instructions leaflet so you're not at a loss of what to do.

Hans Kloss is a level-cum-maze game. At the height of World War II, Hitler had instructed his scientists to develop a new powerful missile. This missile was to be built in a secret location in an underground bunker, where once completed it would be launched against enemies trying to put Hitler's reign to an end. This is where you come in as secret agent Hans Kloss. Your main objective is to retrieve all relevant documentation and plans for the new missile.

On booting the disk, you'll be confronted by the title screen showing our hero, complete in uniform and cap reading what seems to be his objectives. The graphics here are very well defined with good colour and facial features. Along with this is a catchy piece of music. In fact it's not monotonous at all (for once!) so like me you'll probably leave this playing.

On pressing the fire button you start at the main playing screen. The main playing area takes up about two thirds of the screen. The lower third is used for information such as score, health, keys and documents collected. You'll notice a 'chicken leg' and a 'cup of steaming coffee' which represent food and drink. Both these settings are at 99 when you start the game, but soon deminish at not a too speedy rate. At the middle of the screen is our agent Hans Kloss in a well detailed uniform awaiting your commands.

Movement is achieved via the joystick, left, right, up and down. The fire button is used to pick up various objects placed in the walls. There are nine pictures and 12 pieces of document to be collected as well as food and drink as and when required. A good idea is to try and remember where the food and drink are, so you can return to collect them when needed. The screen are well detailed and 'flip' rather than scroll when you move off of your present screen.

GAMES REVIEW continued

There are lifts which are easily negotiated by standing in them and pulling down or pushing up depending on which way you want to go. You'll come across the odd robot which moves aimlessly left and right. These are easily passed by jumping over them, however contact with them can result in valuble loss of health (food and drink). There's also the sniper gun operated via a trip switch, which once crossed will result in instant death. These switches can however be delayed for a few seconds by pressing a delay button which is often found near to the gun and trip switch. Simply jump at the button to give a few seconds time to dash past the trip switch to safety. When the trip switch is unlit you're safe to pass, armed is yellow.

Well, a graphic adventure of this sort would not be complete without a need for keys, as there are many locked doors ahead of you. There are keys set around the underground which can be collected, though do be careful as you may get into some rooms and find the only possible route out is via a locked door.

As you search the various rooms you'll soon come across parts of documents and pictures for the plans of the missile. Once you pick up a piece the screen will show which pieces you have and will soon unravel a full picture of the mystery missile!

If you're like me, a smoker, (filthy habit I know!) and you wish to pause the game for a quick drag, then simply press the space bar. This part is a good bit of programming as while you're taking a drag so does our hero Hans. He'll stand casually taking a drag of his fag then blows the smoke out (very nice touch!). Another nice touch is when you eat or drink when you're health is already topped up, Hans will simply eat the food and then throw up which puts your health in a worst state!

Hans Kloss is definitely the best graphic adventure I've ever seen. The programming is excellent as are the graphics and music. It's a great pitty these lads in Poland weren't discovered by Atari a few years ago as I'm sure there'd have been a larger range of good quality software. Hans Kloss is currently available from none other than Micro Discount and at a mere £5.95 it's excellent value!

MARK'S GAMES COLUMN

Well, some gossip for this issue, I am now an ST owner! Please stop throwing the eggs, and rotten veg. I haven't left the 8-bit, honest! HONEST!!

You see, I had no choice really. I just have to be able to play Trinity by Infocom and it's not available on the 130XE, nor for that matter is Dungeon Master (if only). Anyway, enough small talk, let's get down to business. We have another full solution by Denon of Israel this issue: Ghost Town. After that, there a few hints and tips to save yet more agony in the small hours.

Here comes another one, another adventure solution by DENON from ISRAEL.

GHOST TOWN

Okay, pardner, it's time for a little trip to a gen-u-ine ghost town! But don't worry, them's *friendly* ghosts. So, mount up and let's get going!

The Jail and the Barbershop. Start things off by going into the Barbershop, where you'll find a Stetson hat. Shake the hat and drop it. Get the key that fell out, then leave (you don't need the hat for anything). Drop the key in the street. Go West (Pet Shop Boys? MS!) along the street and you will come to the Saloon and the Dry-Goods Store. First go to the Saloon and get the bell, then go to the Dry-goods Store and pick up the matches, and shovel. Back in the street, go West once again, which brings you to the Telegraph Office and the Hotel.

Go into the Hotel, then East into the empty room. Drop the bell and return to the street. Now enter the Telegraph Office, and move the safe. Connect the two loose wires so that the telegraph key now works. You'll be needing it later. Leave the Telegraph office, then go West until you come to the fork in the road.

From the fork go South to the edge of the ravine. Burn the sagebrush, then enter the ravine. Here you will find charcoal (from the burnt brush) and the entrance to a mine. Go into the mine. Although it's dark and you can't see it, there is a silver bullet here. Get the bullet, then go down. You can move in the dark safely so long as you always move in the right direction.

Now get the candle and light it. Ah, you can see again! Go South, and dig roof. You have found your second treasure, a gold nugget. Get that, and go back North and Up out of the mine. Remember to pick up the charcoal before leaving the ravine!

Now go to the fork in the road, and drop off the shovel and the charcoal. From there, go East back into town until you come to the stable. Enter the stable, and then the stall. Get the horseshoe, then make your way back out to the street.

Now head along East to the Dry-Goods store. Drop the candle outside, treasures inside, then go out and East again to the Jail. Pick up the key, then use horseshoe. It's magnetic and will open the door to the Jail. Enter the jail, and unlock the inner door with the key. Drop the key, and go through the door into the cell. Pick up the hammer, then leave the Jail, making sure you also take the derringer with you. Drop the derringer in the street.

It's time to play blacksmith, so go all the way West to the stable, and then enter the stall. This time, mount the horse, with the silver spurs. Spur the horse, and you will get into the manure pile outside the stall. Get up (phew!) out of the manure pile, and re-enter the stall. There will now be a hole in the wall leading to a store room. Go through the hole and get the keg of nails. Back in the stall, empty the keg and drop it. Now get the nails, and shoe the horse. Drop the hammer and mount the horse.

MARKS GAMES COLUMN continued

Say giddyap! (the magic word!), and the horse will take off. Eventually, you will be thrown, and that's the last you'll ever see of Old Paint. Brush yourself off, and enter the teepee in the hidden canyon. Pick up the two treasures there, then go back outside.

There doesn't seem to be any way out, but have no fear! Beat the tom-tom, and the ghost of Geronimo will appear. Say How, and ZAP! guess where you are? Right, you're back in the manure pile again (hehehe). Get out of that, then head along to the Dry-Goods store and drop off the treasures (don't forget to drop the spurs, too!).

Somewhere along the line here you may have heard mysterious ghostly sounds and or voices. The sound of the bell indicates that a ghostly piano player is now visible in the Saloon, and the voice gives you a clue as to what to do about him. If you are near the Saloon when you hear the bell, go inside, and applaud the ghost.

He (it?) will stand up, take a S bow, and vanish. The piano, however, will remain behind, as a solid object. If you open the piano, a map will fall out. This map tells you to "dig roof", but since you've already done that, you don't need the map, so you can just leave it there.

Once you've dropped off the Indian treasures and (possibly) applauded the ghost, return West to the fork in the road. Get the shovel and charcoal, then go North to the field. Dig here, and you will find some yellow powder (it's sulphur). Get the powder, then go to the manure pile in the stall.

Holding your nose, dig around in the manure, and you will uncover some white crystals. Get those, then head into the stall. Mix the stuff you're carrying around, and you will make some gunpowder. Fill the keg with that, then get the keg and go to the Telegraph Office.

Drop the keg in the office. Under no circumstances should you touch the telegraph key, or BOOOOM! (time to restore the game!). By this time, it's probably getting dark outside. Don't worry, you'll be able to make it to the hotel before sunset.

Just leave the Telegraph Office, enter the Hotel, and go East to the room where you dropped the bell. Ring the bell, and, like magic, a bed appears! Drop the bell, get into bed, and have a good night's sleep.

When morning arrives, get up, then move the bed, revealing a roll of tape. Get the tape and leave the room. On your way out, go to the counter and get the cashbox. Now return to the Saloon, tape the mirror, and break it, thus revealing a hidden office. Drop the tape, go through the hole into the office, and get the Go board.

Now it's time for another trip to the Dry-Goods Store. Drop off the cashbox and the Go board. Now, pass Go, and collect $200 (tricky, huh?). After that, leave the store and head West to the fork, then South to the ravine. This time, jump across the ravine.

You are now in the mountains. Go West along the trail to the line shack. Enter the shack, and tap the telegraph key. Boom! The gunpowder in the keg just went off! Now, look at the floor and you'll notice a loose plank. Get the plank, drop it, then go down the hole into the root cellar. Collect the pelts, then go back up and make your way across the ravine and into town. As you pass where the Telegraph Office used to be, you'll see a smoking open safe. Look inside, and pick up the gold dust.

Continue East and pick up the derringer, then keep going East until you come to Boot Hill. Shoot the rattlesnake with the derringer (it's a water pistol!), then dig a grave and (gulp!) go into it. Here you find a coin and a purple worm. If you want to indulge in some gratuitous violence, you can kill the worm. In any case, drop the shovel and get the coin.

Now climb back out, and make another trip to the Dry-Goods store. Drop all the treasures, then go back out into the street. Get the candle, then wait for sunset. Once it's dark, go into the Saloon. A ghostly square dance is in progress (that's what the fiddle strings are all about). Still in the dark, do a little dancing, and you will win a prize.

Now you can light the candle. The dancers will vanish, and you can now make your final trip to the Dry-Goods store. Drop the cup you just won, and say "Score". All right! You did it, you collected all thirteen ghost treasures! After all that, why not take a vacation? I know this little deserted island that would be just perfect.....

HINTS AND TIPS:

To get out of the dark in Dallas Quest ask for a clue.

In Mordon's Quest, sacrifice the frog at the altar to enter the waterfall.

To enter the spaceship in Starcross, press the circle which represents the planet shown on your map.

Anyway, I'll just go and clean the veg away, and get back to Dungeon Master. Stop it!!! It was only a joke, get offff.
by Mark Stinson

CODING CAPERS COLUMN.

by Andrew C. Thompson.

SPRITES, BOBS, PMG's, Moveable thingamajigs etc..

Hiya TWAUGarians, yet another issue of this intellectual newsletter and yes, you guessed, here we are again for a second intriguing caper of coding.

Well, after having my first column in print, I sat in anticipation waiting for all your letters to flood in but did I get any? Nope, well just a couple. One chap wanted to know how I performed the Wavy Text in my demo on the issue #1 TWAUG disk.

CODING CAPER COLUMN continued

My answer to you will come in a following column, but for the moment I'm going to start on the lines of another chaps letter (because it arrived first). The subject of Player/Missile Graphics is in hand now, but because I am so late in getting this issues column up to Dave E. I'm just quickly going to show you how to overcome the problem of lack of colour in PMG's, and how to overcome it without using DLIs, VBIs or Machine-Code, OK.

Firstly, before I kick off I'll let you know that I wrote an article with all the information you need to create your own Player Missile Graphics back in issue #2 of TWAUG, so if you have that issue then you can use it as reference. On the other hand, appendix C10 in my book, "The Complete and Essential MAP" (or TOMO's map for short) supplies you with the information, see issue #10 of this newsletter on how to get hold of this book if you don't have it, if you can't afford it straight off then Dave will quite happily allow you to pay bit by bit which is something that not many groups allow you to do!

Rightyho, less yap more coding chat...

To achieve more colour in PMG's, the simplest way is to overlap 1 player with another and design your single image in the 2 players. Now, since your using 2 graphics this allows you to design your image with 2 colours doesn't it. To make things better again, how would you like to get 3 colours in your graphic. You do this by setting bit-5 (decimal 32) at location 623. So, as an example try this:

```
10 POKE 53248,130:POKE 53256,0
15 POKE 53249,134:POKE 53257,0
20 POKE 53261,255:POKE 704,130
25 POKE 53262,255:POKE 705,52
30 POKE 623,32
```

Truly great eh! The way it works is that your 2 PMG colours are there as usual, but the 3rd colour is there because when you set bit-5 at location 623 (decimal 32) the 2 PMG colours (players #1 and #2) are logically OR'd together, the result being the 3rd colour. Anyway, I'm not going to delve into that, instead I'm going to tell you that it is also possible to achieve more colours than this whilst only using these 2 players. No other players, screen colours or DLI's are involved. I've really got you intermediate programmers thinking now haven't I! How is this legendary PMG problem of lack of colour curable? OK then, I won't keep you in suspense any longer, the answer lies in a technique known NOT as Artifacting, but as Bleeding. Which although I admit is very similarly achieved, the results are better.

Here's what you've been waiting for then, the program to back-up my article:

```
100 NT=PEEK(106)-8:POKE 106,NT
110 GRAPHICS 0:POKE 710,0:POKE 559,62
120 POKE 54279,NT
140 POKE 53248,150:POKE 53249,150
150 POKE 53256,3:POKE 53257,3
160 POKE 704,16*8+6:POKE 705,16*3+6
170 POKE 53277,3:POKE 623,32
180 RESTORE 300
190 FOR I=0 TO 8*9-1:READ D
200 POKE NT*256+1024+I+8,D:NEXT I
210 FOR I=0 TO 8*9-1:READ D
220 POKE NT*256+1280+I+8,D:NEXT I
290 REM
300 DATA 255,255,255,255,255,255,0,0
301 DATA 0,0,0,0,0,0,0,0
302 DATA 255,255,255,255,255,255,0,0
303 DATA 255,0,255,0,255,0,0,0
304 DATA 255,255,255,255,255,255,0,0
305 DATA 0,255,0,255,0,255,0,0
306 DATA 0,255,0,255,0,255,0,0
307 DATA 255,255,255,255,255,255,0,0
308 DATA 255,0,255,0,255,0,0,0
309 REM
310 DATA 0,0,0,0,0,0,0,0
311 DATA 255,255,255,255,255,255,0,0
312 DATA 255,255,255,255,255,255,0,0
313 DATA 0,255,0,255,0,255,0,0
314 DATA 0,255,0,255,0,255,0,0
315 DATA 255,0,255,0,255,0,0,0
316 DATA 255,255,255,255,255,255,0,0
317 DATA 255,0,255,0,255,0,0,0
318 DATA 255,255,255,255,255,255,0,0
```

Have you run it up? Can you believe it, 9 colours from 2 PMG's! If you LIST line 160, erase the line number and then alter the POKE values (colours) you'll get some odd affects and with a bit of luck you could even work out just how it's done.

Basically what happens is this. You've only 3 main colours to choose from, them being the very top 3 of the bars but by mixing these on opposite scan-lines the eye-view of the displayed colours bleed together and appear as something else. The combinations are in the DATA, lines 300-308 being for player #1 and 310-318 for player#2. Each number in the data representing a succeeding row in the player missile graphics.

Anyway, I'm going to sign off for the time being and don't forget to write to me at the usual address:

CODING CAPERS.
10 THORNCLIFFE COURT
BLENHEIM ROAD
CWMBRAN
GWENT
SOUTH WALES

Next time I promise I'll cover the subjects in your letters to the word, it's just that I'm back in work now and I'm doing up my flat, things tend to get a bit out of hand and my time is sparse. Anyhow, chow for now.

THE BEGINNERS GUIDE TO COMMUNICATIONS

By Nicholas Kenton Haflinger - DBL

Introduction

Welcome to the wonderful world of computer communications!

Well, I don't know if you can plug your TWAUG newsletter to the Net, but it's a way to start with my craptalk...:-)

Forgive me if this document seems overly patronising, but it is aimed specifically at the comms beginner who has no or very little knowledge of bulletin boards and the facilities they offer. So without further delay...

Bulletin Board Systems (BBS)

A bulletin board is basically a computer, coupled to a modem, running specific software which allows the user to access it over a telephone line in a controlled and pre-defined manner. The bigger, and usually far more popular, boards have a large capacity hard disks, a fast modem and maybe a couple of extra telephone lines.

Most bulletin boards in the UK are run on an amateur basis, albeit in a very professional manner, so money is not charged for their use. Instead, the system operator, or SysOp, runs the board out of his/her own pocket for their own personal interest and enjoyment. However, it's an idea to send the SysOp of your favourite board money in return for using the services which it provides. Remember, these guys have to pay the phone bill too!

Always remember that the SysOp acts as judge, jury and executioner while you are a guest on their system, and they have absolute right to bar you from the board if your actions warrant such extreme measures. Most SysOps however are not evil monsters scrutinising your every move, but extremely nice and helpful people - why else would someone tie up a computer, modem, hard disk and a telephone line(s)??

Establishing a BBS Account

When you call a bulletin board, you are required to log on. The first time you call a board you will be taken though the initial procedure which will establish a new user account on a said board (here I want to thank John 'ANG' Maris for saving my time). Usually you will be asked to leave your telephone number, and to give some indication from where you are calling from. It's important that you establish an account using your real name and details, and bogus users are quickly weeded out. Anyway, you can be whoever you want in the CyberSpace. If you want to know more about the Cyberpunk movement stay tuned or read further issues of Mega Magazine (P.O. Box 164 / 8800 AD Franeker / The Netherlands) or just get in touch with us (see address below).

When establishing an account, you are required to choose and enter a password which will be used to re-open that account at a later date. So why have a password?

Well, each user on a board has their own account which contains the current statistics for that board: downloads, uploads, number of calls, etc. Hence, the password is used to confirm that you are who you say you are, and without it you won't be allowed to logon under a previously established name.

Using the BBS and its etiquette

After logon, some introductory messages are sent to you. They may be pleas from the SysOp for money, some local news, or messages detailing forthcoming events. In any event, it's always polite, and to your own advantage, to read and take notice of them. Alas, not many people do take heed of these bulletins and as consequence needlessly pester the SysOp over something which was made quite clear at log-on.

An example might be when one of my SysOps (that's diplomacy!) accidentally erased his userbase, and was pestered by users demanding to know why their accounts had been lost for well over a month, even though all was made clear to those who could be bothered to take a quick look at the news bulletin. After these messages, you are usually given a quote for the day, and then taken to the main menu.

Now you have access to the board proper, it's a good time to preach about the proper etiquette. The basic philosophy is simple: put as much into the board as you take out, don't make a nuisance of yourself, and always keep your language clean. Remember, bulletin boards are fully open to the public and strong language won't, in general, be tolerated.

It's also an idea to logoff cleanly. This involves selecting the appropiate option from the main menu, and then letting the bulletin board terminate the connection. If you just hang-up, then this may "stun" the board, and it may not answer incoming calls for a while. I've experienced this numerous times. Sometimes this is unavoidable, like if your computer throws a fit and crashes, but on the whole it's frowned upon.

Another thing which can annoy SysOps is continually downloading files and not uploading anything in return. This is known as "troffing". To kurb this, many boards will only allow a specific number of donwloads for every upload you make. Sometimes a different approach is taken, with the size of the downloads dependant on the size of uploads made. Remember, boards rely on new files to keep then ticking over, so make a contribution!

The facilities a bulletin offers are numerous and varied, but sometimes as a new user you will not be permited to use them. The most common restrictions placed on new users are on the amount of downloads you can make, or even if you are allowed to make them at all. Usually the SysOp will grant you full privileges a few days later, after verification. What you are not entitled to is entirely at the SysOps discretion.

Finally, I'd like to thank Phil O'Malley for his great help: well, thanks Phil! And also biiig thanks to all those great BBSes around the Globe which let us use their cool services!!!

COMMUNICATIONS continued

If you still want to know more about BBSes or Computer Nets or anything else do not contact us...(big grin) Just joking! You may reach us under the following postal address: DIGITAL BREATH LTD. / P.O. Box 4060 / E-35011 Las Palmas de GC / Canary Islands / Spain. You may also upload your messages into QuickBBS Leeuwarden: +31 58 153849, or ANG BBS: +31 1150 13275; both are located in The Netherlands. Place your craptalk to 'Nickie Haflinger', and don't be afraid if I take my time to answer - I like to fool around in the Nets :-) For a faster contact use the following numbers: +34 28 208958 (voice - from 21:00 to 00:00 GMT every weekday) or +34 28 209801 (fax - 24 hours on-line, when it's not on strike!)

That's all for now. Till next issue! (I hope...)

MUSICAL FX

By Mark W.

Playing Samples and Sample FX

I have owned a Replay cartridge for a few years now so have picked up a few ways of displaying digi-demo's. In this article, for those who know assembler, I attempt to show you how to play samples and what kind of display you can use. I apologise in advance for the fact that I can't write articles to save my life!!

It is commonly thought that when samples are being played the screen must be switched off. This however is not true. The reason is that the ANTIC chip 'steals' machine cycles to obtain the data for the screen. If ANTIC 'steals' a lot in one place this messes up the timing! For example in one place in graphics 0 (to get the character set!) ANTIC 'steals' seven thousand machine cycles in one place per frame!! This is almost a third of the processor time.

It may be possible to have a display list as such: (Memory map modes)

```
$70                          24
$70                          Blank
$70                          Lines
$4F,Ladr,Hadr
$4F,Ladr,Hadr                Lines
$4F,Ladr,Hadr                Of
$4F,Ladr,Hadr
Graphics
$4F,Ladr,Hadr                Mode
$4F,Ladr,Hadr
Etc.
```

The above has fairly regular DMA and should be possible in theory. But by far the best way is PMG's as these only take 5 machine cycles per scan line. Also if you are running out of memory you can still have 'constant shape' PMGS.i.e. PMG's that are set by the GRAFPx registers. These take no memory!! A player can be used to make a nice wavy effect in time to the music.(As is seen in Mirages/ANG's Soundtracker Player.)

MUSICAL FX continued

Anyway before I can show you how to do this check out the flow chart for how to play samples. Got it? If you can't work it out contact me. The current byte should be stored in X or Y then it is easy to recall for the next bit of sample data (2 are stored in one byte.)

So now you know how to sample! The first FX I am going to show you is those strange coloured bars people put down the screen. This is by far the easiest way. Firsty the DMA should preferably be off. At points Br or points Bl (For respectively Brown or Black bars) place the following code:

```
STA COLPF4
```

Thats it!! Easy isn't it? Anyway that looks very boring! So onto the PMG method. This is done by altering the HPOSPx of the player used depending on the sample data. I normally use 90+sample data (with bit 4 set). So this FX is done by:

at point Y:

```
LDA #255
STA GRAFP0
LDA #(COLOR)
STA COLPM0
LDA #3
STA SIZEP0
```

at point Br

```
ADC #90
STA HPOSP0
```

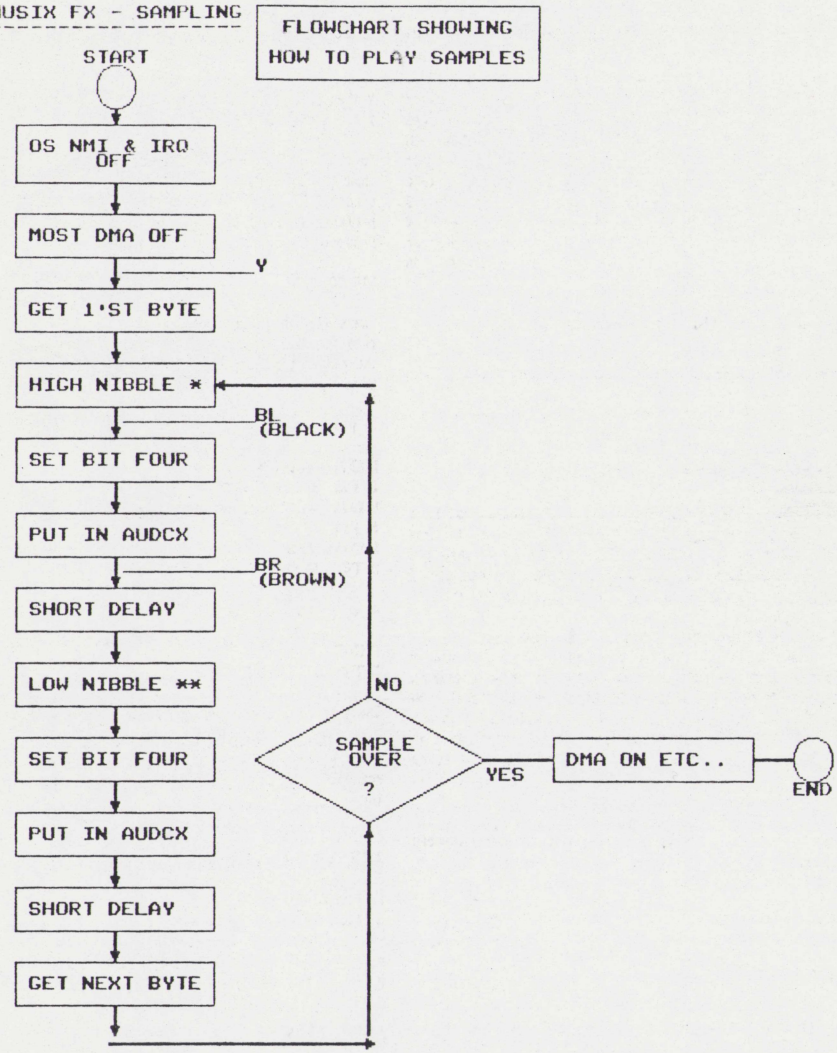
Thats it then! Easy when you know how. Of course instead of using GRAFPx registers you could use DMA for PLAYERS and MISSILES. Then you could make a pretty picture with the remaining PMG'S!! If you have any questions then please write to:

Mark W.
122 St James Rd
Bridlington
N.Humberside
YO15 3NJ

Please enclose a SAE unless I know you!! I will try to reply quickly but I am only at that address every week or two. Happy sampling.

When Mark sent us this article, he also included an excelent sample demo. Unfortunately, the disk for this issue had already been put together so we will be including the demo on our issue 12 disk. Thanks Mark.

MUSIX FX - SAMPLING



* PUT HIGH NIBBLE OF CURRENT BYTE IN LOW NIBBLE OF ACCUMULATOR

** PUT LOW NIBBLE OF CURRENT BYTE IN ACCUMULATOR

ATARI SUPPORT from RICHARD GORE

ARENA: The full 50 level version of the excellent puzzle game that was a demo bonus on Page 6's issue disk.
Price: £5 ($10) XL/XE Disk only.

BUBBLE ZONE: A fast blast em set on a grid being invaded by ever expanding bubbles. Collect the tokens and see how far you can advance.
Price: £5 ($10) XL/XE Disk only.

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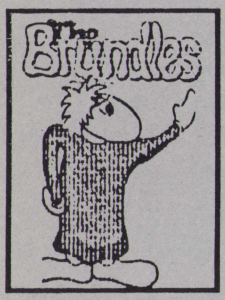

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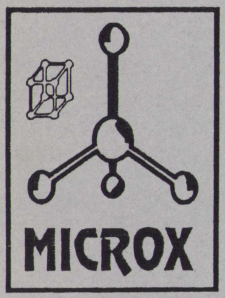

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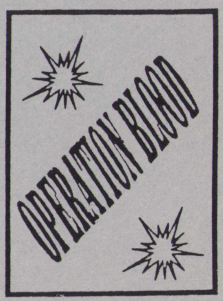

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Still Available:

Swift Spreadsheet (Standard) - £9.95

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(NOTE: New version includes a revised 40 page A4 manual. For details of the standard version and of the program itself, please refer to the review in issue 67 of New Atari User).

Available Soon

Menu Print: Still under development and currently undergoing its THIRD rewrite! We apologise for the delay but we expect the programming to be definitely completed by the end of September. More details will be published when ready.

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We at TWAUG are receiving the CN magazine monthly and we are always looking forward to it.

PHOENIX.

The new disk based news letter from Ireland, produced by Robert Paden.

PHOENIX a double sided disk, side 'A' will be packed full of text files containing Articles, reviews and much much more. Side 'B' will contain a good selection of PD software.

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